Civil & Environmental Consultants, Inc.

DESCHUTES COUNTY DEPARTMENT OF SOLID WASTE

LANDFILL SITING CONSULTANT SERVICES – PHASE 3

CEC | Sacramento
Project 344-729

August 23, 2024

August 23, 2024

Mr. Tim Brownell, Director of Solid Waste
Deschutes County Department of Solid Waste
61050 S.E. 27th Street
Bend, OR 97702
Submitted via Email: tim.brownell@deschutes.org

Dear Mr. Brownell:

Subject: Request for Proposals: Landfill Siting Consultant Services: Phase 3
CEC Project 344-729

As the lead consultant for the Project Team, Civil & Environmental Consultants, Inc. (CEC), is pleased to submit this proposal to the Deschutes County Department of Solid Waste (DCDOSW) in response to the Request for Proposals issued July 16, 2024, for the above referenced project. CEC has assembled a strong team of subconsultants from Bend and the surrounding area, with some that worked on the Negus Transfer Station project including Blackmoore Planning, Transight and Wallace Group. All the subconsultants bring a depth of local experience to the project. CEC has teamed with Rabe Consulting, The Wallace Group, Blackmore Planning and Development Services, Transight Consulting, and Archaeological Investigations Northwest, which are based in Klamath Falls, Bend, and Portland, Oregon, respectively. This is almost the same team we assembled for the Negus Transfer Station project, which we completed for the DCDOSW. We feel that with this team we are supremely qualified to perform this work

Based on the wealth of experience, this Project Team will be able to deliver the project, as required by the DCDOSW. The primary contact for this project is:

Mr. Jeff A. Shepherd, PE
2356 Gold Meadow Way, Suite 120
Gold River, CA 98670
(405) 823-7772 Phone
jshepherd@cecinc.com

Thank you for considering our proposal and we look forward to the opportunity to work with the DCDOSW.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Jeff A. Shepherd, P.E.
Senior Principal

Lindsey Angell, P.E.
Principal

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APPENDICES

1.0 Team Overview

This section is the Team overview describing the role of each Team member. As described above, we are teaming with companies that are based in Bend as well as Klamath Falls and Portland, OR. These firms bring a wealth of local knowledge that will be critical to the success of the overall project. CEC will be performing the overall project management as well as the completing the Environmental Assessment and the permitting design work for the Oregon Department of Environmental Quality (ODEQ) solid waste permit. Transight will be completing the traffic studies required by the Land Use Entitlement permitting process. They will be working closely with Blackmore Planning and Development Services who will be completing the permitting documents for the Land Use Entitlement permitting. CEC will be providing assistance to these firms during this process. The Wallace Group will be completing the work associated with the Phase I and II Site Characterization and the geotechnical study. Rabe Consulting will be completing the work associated with the BLM permitting, including the endangered species work. Finally, Archaeological Investigations Northwest will complete the formal archaeological investigation for the Moon Pit site.

Civil & Environmental Consultants, Inc.

Civil & Environmental Consultants, Inc. (CEC) is recognized for providing innovative design solutions and integrated expertise in air quality, civil engineering, ecological sciences, environmental engineering and sciences, survey/geospatial services, waste management, and water resources. Headquartered in Pittsburgh with 37 additional offices throughout the United States and more than 1,400 employees, CEC has worked with hundreds of municipalities and public sector agencies on a wide range of projects.

Insider Experience. CEC understands the nuanced characteristics of public sector work from the inside, having strategically added professionals who previously worked for governments, economic development authorities and public agencies to drive us to deliver services from their unique perspective. CEC's multi-disciplined and integrated service approach allows public officials to be proactive rather than reactive when navigating the challenges of their projects, and to understand how these challenges may affect their communities and financial responsibilities.

Safety First. CEC believes that all accidents are preventable and is committed to creating an accident and incident free workplace for employees and subcontractors through training, safe work practices and processes for assessing project hazards. CEC strives for safety excellence throughout our entire organization and holds employees and subcontractors accountable for the safe performance of their work.

Market Oriented. Multi-disciplined Market Groups are derived from the primary practice areas to strategically focus on the business challenges and drivers of the manufacturing, mining, natural gas, power, public sector, real estate and solid waste markets. Each of these diverse teams is a conduit to the latest thinking and advancements in the markets we serve, allowing CEC to provide clients with concise, timely information and regulatory updates to facilitate informed decision-making.

Employee Owned. CEC's employee-owners are highly motivated by the link between our success and that of our clients. Our continuing growth reflects client confidence in the work of our employees, who are guided by three core business principles:

- Senior Leadership
- Integrated Services
- Personal Business Relationships

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Sacramento Office
2356 Gold Meadow Way
Suite 120
Gold River, CA 95670
(405) 823-7772

Transight Consulting, LLC

Development Services. Having served developers with transportation engineering services across the US for 16 years Transight Consulting, LLC (Transight) understands that transportation costs can be a critical determinant factor in whether or not a project moves forward. Transight provides prompt service, and can quickly help inform the overall pro forma and support project entitlements with formal Traffic Impact Analyses or Trip Generation Letters depending on agency requirements. With experience throughout the northwest region, Transight can oftentimes identify initial project risks and fees with a very basic understanding of the conceptual development plan.

Planning Services. With an office located in Central Oregon, Transight can readily serve public clients throughout the region with informed and feasible project solutions. Transight provides experience with on-call services, project review, grant support, safety analyses, peer review, and planning services ranging from intersection review to corridor and

TRANSIGHT CONSULTING, LLC

61271 Splendor Lane
Bend, OR 97702
(503) 997-4473

transportation systems planning. Transight partners with a range of experts that specialize in policies, planning, GIS, graphics, access, and public outreach.

Blackmore Planning and Development Services, LLC

Blackmore Planning and Development Services (Blackmore Planning) is Central Oregon's premier full-service Land Use Planning firm. Blackmore Planning has over 15 years' experience in Central Oregon, working in real estate development, with non-profit organizations, local governments, private development firms, and with national corporations. Blackmore Planning has expertise in complex planning assignments, from project conception, design, and implementation to application assistance, review, and decision-making. The firm's management has experience on both sides of the planning counter, working as City Staff, with developers, and with Planning Commissions. Blackmore Planning prides itself on identifying unique development challenges and working with developers and jurisdictions toward creative solutions.

BLACKMORE PLANNING AND DEVELOPMENT SERVICES, LLC
19454 Sunshine Way
Bend, OR 97702
(541) 419-1455

Wallace Group, Inc.

The Wallace Group, Inc. (Wallace Group) is a multi-disciplinary, geo-environmental engineering firm based in Bend, Oregon. The practice was established in 1997 and provides practical "Applied Earth and Environmental Science" solutions to commercial, industrial, governmental, and institutional clients throughout the Pacific Northwest. Wallace Group staff are the recognized experts on central Oregon's geosystem, and includes engineers, geologists, hydrogeologists, construction inspectors, technicians, and regulatory compliance specialists with technical expertise in the following practice areas:

- Foundations studies and earthwork monitoring/testing for bridges, buildings, transmission lines, communication towers, dams, levees, pipelines, municipal and transportation infrastructure;
- Geologic hazards studies related to lava tubes, earthquakes and landslides;
- Environmental studies of soil, surface water, groundwater, sediments, and building materials and their potential impact to human health and the environment;
- Regulatory compliance assistance for industrial processes, stormwater, and asbestos;
- Water supply studies and water rights;
- Mining resource evaluations and reclamation plans;
- Construction special inspection of concrete, masonry, structural steel, welding, fireproofing, and soils; and
- Laboratory testing of soil, rock, and construction materials in an American Association for Laboratory Accreditation (A2LA) accredited facility.

THE WALLACE GROUP, INC.
62915 NE 18th Street
Suite 1
Bend, OR 97701
(541) 382-4707

Rabe Consulting

Rabe Consulting (Rabe), founded in 1997, is an environmental consulting business that serves both the private and public sectors. We specialize in wetland science, botany, wildlife biology, National Environmental Policy Act (NEPA) compliance, Phase 1 and Phase 2 ESA's, restoration projects and environmental education. Our company headquarters are based in Klamath Falls, Oregon, 60 miles south of Crater Lake National Park with a satellite office in Fresno, California. We focus our work in the Cascade Mountains, the high desert country of eastern Oregon, and northern and central California, but provide our services throughout the United States. Rabe Consulting is registered as a disadvantaged small business (DBE in Oregon and California) and a women-owned business (WBE). Rabe Consulting is also HUB Zone certified.

RABE CONSULTING, LLC
421 Commercial Street
Klamath Falls, OR 97601

Archaeological Investigations Northwest

Archaeological Investigations Northwest, Inc. (AINW), founded in June 1989, provides the full spectrum of cultural resource consulting services to both public and private sector clients in the Pacific Northwest. For over three decades, AINW has conducted more than 3,000 cultural resource projects that encompass the breadth of cultural resource disciplines: archaeology, architectural history, history, and ethnography. Most of these projects have been done to meet the compliance regulations of Section 106 of the National Historic Preservation Act and documentation for Environmental Assessments (EA) and Environmental Impact Statements (EIS), and for local and state agency review of development and energy projects. AINW also conducts lithic analysis for other firms and provides training in lithic technology. AINW's blood residue analysis laboratory has conducted several hundred individual studies in the past two decades.

ARCHAEOLOGICAL INVESTIGATIONS NORTHWEST, INC.
3510 N.E. 122nd Ave
Portland, OR 97230

AINW's staff of approximately 30 employees includes more than 20 professional archaeologists, architectural historians, and historians. These include staff specialists in faunal analysis, human osteology, lithic analysis, historic artifact analysis, and specialists in blood residue analysis, GIS/graphics, and report production. Supporting all is our very capable administrative staff.

2.0 Proposal

The following represents our proposal for the work as outlined in the Request for Proposal (RFP) dated July 16, 2024.

2.1 Team Capabilities

Our team's capabilities, experience and resources are presented below including key Personnel and their roles within this project. Full resumes for each key person are included in Appendix C. We have organized our team in this way so that we can offer superior services to Deschutes County Department of Solid Waste (DCDOSW). See the Organization Chart on Page 9. Our team will consist of the following principals at their respective firms.

Civil & Environmental Consultants, Inc.
Project Manager – Mr. Jeff A. Shepherd, PE
Principal in Charge – Ms. Lindsey Angell, PE

Transight Consulting, LLC
Project Manager – Joseph W. Bessman, PE

Rabe Consulting, LLC
Project Manager – Andrea Rabe

Archaeological Investigations Northwest, Inc.
Project Manager – Ms. Eva Hulse

Blackmore Planning and Development Services, LLC
Project Manager – Gregory Blackmore

The Wallace Group, Inc.
Geotechnical Project Manager – Lisa M. Splitter, P.E., G.E
Hydrogeological Project Manager – Mr. Scott Wallace, R.G., C.W.R.E.

CEC provides consulting and engineering services for the management and disposal of a broad range of wastes and facility types, including landfills, transfer stations and recycling facilities. We provide these landfill services to a wide variety of clients including fortune 500 companies, regional privately owned companies, family run businesses and public entities. As an example, CEC serves as the Engineer of Record for the engineering, permitting and environmental needs at the Coffin Butte Landfill owned and operated by Republic Services (located near Corvallis, OR) including conditional use permitting, compliance, permitting, site investigations, civil engineering, and engineering cost estimates. We have performed the design, permitting and/or construction support for many landfills located in Oregon, Washington and California. Examples of projects for public entities include the feasibility evaluation, design, and permitting of the City of Ada Landfill Expansion in Ada, Oklahoma and the engineering design and permitting for the City of Burbank Landfill located in Burbank, California. CEC will be performing a majority of the work in the Sacramento, CA, office but other offices will assist as necessary.

Transight worked on the Senate Bill 1544 (Land Swap) project, which was unanimously approved by the Deschutes County Board of Commissioners and the City of Redmond. Also, Transight worked on the Deschutes County Safety Campus. Transight will complete all of the work in their Bend, Oregon office.

Blackmore Planning and Development has successfully consulted on hundreds of projects throughout Central Oregon, including the Cities of Bend, Redmond, Sisters, LaPine, along with Crook County, Jefferson County and Deschutes County. Furthermore, Blackmore Planning has served as the Planning Consultant for a number of Central Oregon jurisdictions and districts, including the City of Bend, Deschutes County, the Bend-La Pine School District, the Bend Park District, and the City of Redmond.

The Wallace Group was responsible for the geotechnical design of the Negus Transfer Station as well as the Southwest Transfer Station Expansion project in LaPine, Oregon. The Wallace Group has also completed projects related to Phase 1 and Phase 2 Site Characterizations for landfills located across Oregon. Currently, they are completing the Phase 1 and Phase 2 Site Characterization for the Coffin Butte Landfill Conditional Use Permit application that is ongoing. Wallace Group will complete all of their work from their Bend, Oregon office.

Archaeological Investigations Northwest (AINW) is among the most highly qualified cultural resource management (CRM) firms in the western United States and offers the most capacity of any CRM firm in the northwest. The company provides archaeological, historical, architectural history, Geographic Information Systems (GIS), and specialized laboratory services. AINW has more than three decades of cultural resource experience regarding a wide range of regulatory compliance and cultural resource projects. AINW professional staff have extensive training and experience with federal, state, and local cultural resource laws, regulations, guidelines, and procedures. Our staff includes specialists in prehistoric and historic-period archaeology, historical research, architectural history, faunal analysis, historic artifact analysis, lithic technology, GIS, human osteology, and blood residue analysis. We also have skilled technical and support staff involved in field archaeology, laboratory analysis, and report and graphics production.

Rabe Consulting performs initial studies and documentation preparation for compliance with NEPA regulations. Documents include Biological Assessments, Cultural Resource Surveys, Wetland Delineations, Resource Impact Analysis, Economic Analysis Reports, Air Quality Assessment, Project Alternative Analysis Reports, Capacity and Needs Analysis reports, and high-resolution maps. Rabe Consulting prepares Categorical Exemption Documentation, Environmental Assessments, Environmental Reports and Environmental Impact Statements through use of an interdisciplinary team of professionals.

Project Experience

Coffin Butte Landfill, Corvallis, Oregon | CEC is currently working on an expansion of the existing landfill and we have submitted a conditional use permit application to Benton County, Oregon. As part of the conditional use permit application, we have completed a Phase I and II Site Characterization Study using our subconsultant, The Wallace Group. The Wallace Group has also completed a detailed geotechnical investigation and report for submittal with the conditional use permit application. Our subconsultant, AINW has also completed an archaeological investigation and SHPO permit as part of the conditional use permit application. Furthermore, we have conducted a 3-year wildlife study related to two Great Blue Heron rookeries. CEC has completed preliminary landfill design base grades based on the Phase II site characterization study.

Coffin Butte Landfill, Corvallis, Oregon | CEC is currently working on the Oregon Department of Environmental Quality (ODEQ) permit modification for the expansion of the Coffin Butte Landfill. We are in the process of completing all the design work associated with the expansion area including leachate volume analysis, slope stability analysis, liner system and final cover system design. We are also completing stormwater design calculations to size the drainage channels and stormwater detention pond. Furthermore, we are completing all of the necessary manuals required by ODEQ including the operations manual, Construction Quality Assurance Manual and the Closure/Post-Closure Plan.

Columbia Ridge Landfill and Recycling Facility, Arlington, Oregon | CEC is currently the engineer of record for several past and ongoing projects. In the past, CEC has completed the Module 15 and 16 cell designs including construction bid packages as well as the design of Leachate Storage Pond No. 4. For Leachate Storage Pond No. 4, CEC completed all of the necessary pan evaporation calculations to show the incoming leachate as well as anticipated rainfall will be evaporated completely. Ongoing projects include the update to the Site Development Plan that was submitted to the ODEQ for review and approval. The update included changing the base grades over a major portion of the remaining landfill, which included detailed leachate volume calculations, slope stability calculations and stormwater drainage calculations. Other ongoing projects include the Module 17 cell design including a construction bid package.

Chemical Waste Management Landfill, Arlington, Oregon | The Chemical Waste Management Landfill is a hazardous waste landfill located in Arlington, Oregon that is owned and operated by Waste Management. CEC is currently working on a permit modification to expand the landfill to create a new landfill area called Landfill L15. CEC has completed detailed design calculations for the leachate management system and the stormwater management system. CEC has also completed slope stability calculations. Furthermore, CEC has completed all the required documents for submittal to the ODEQ, including the operations and maintenance plan, the Engineering Design Report and the Construction Quality Assurance Plan.

Senate Bill 1544 Land Swap (2019) | Transight Consulting led the original entitlements for the 465-acre rezone of open space lands to support large lot industrial uses in 2013. The project was highly politicized due to conflicts between local land use and State Highway constraints. Transight worked with the City, County, and ODOT to negotiate an effective solution that was integrated into agency plans. In 2019 Deschutes County revised the boundary to swap more developable lands into the 465-acre boundary and exclude those that were farther from services or required more extensive preparation. This project was unanimously approved in fall 2019 by the County Board of Commissioners and the City of Redmond.

Deschutes County Safety Campus (2018-2019) | Transight Consulting was integral in the design of the Deschutes County Safety Campus is located on the north side of Bend near US 20. In 2018, the County sought to add a sobriety/stabilization center to the campus to reduce unnecessary emergency room visits. As a unique land use, Transight prepared a trip generation approach that was approved by the city and uses as the basis of fees and impact assessments. In 2019, the County re-applied for a more extensive master plan of the area. This work was also quickly approved by the city.

Deschutes County Land Swap | Blackmore Planning led the development team is the submittal of a complex application to swap land inside the City of Redmond UGB with land outside of the UGB. This application was one of three in the State and involved a thorough assessment of State, Deschutes County, and City of Redmond rules, along with presentations before local hearings bodies, Councils and Commissions.

Negus Recycling & Transfer Facility, Deschutes County Department of Solid Waste, Redmond, Oregon | Wallace Group teamed with CEC to provide geotechnical engineer of record and construction observation and special inspection services for the Negus Transfer Station project, beginning in 2020. Construction included seven new buildings, a transfer station, office, maintenance building, recycling center, recycling office and loadout, inbound and outbound scales, and asphalt-paved streets and parking. Detailed subsurface exploration was performed to define areas of undocumented fill and existing waste materials, and to evaluate the potential for lava tubes, frequently found in this area of Redmond. Geotechnical recommendations included compaction of deep fills, 20-foot-tall basalt rock engineered excavations, and large retaining walls. Wallace Group confirmed conformance with applicable codes and the Deschutes County Development Department by providing construction special inspection services including: documentation of waste removal, nuclear density testing of compacted soil, geotechnical guidance of deep basalt cuts, steel reinforcement, concrete testing, and masonry construction.

Coffin Butte Landfill Southern Expansion, Republic Services, Corvallis, Oregon | Wallace Group teamed with CEC to provide geotechnical engineer of record services for the design of the 150-acre cell expansion project, beginning in 2021. The new landfill cell will require cuts of up to 155 feet into the northern flank of Tampico Ridge and construction of new, 50 foot deep leachate ponds. Wallace Group performed subsurface explorations and provided geotechnical and geologic engineering recommendations including slope stability, engineered excavations in soil and rock, and settlement analyses. Project challenges included soft Willamette silt, high groundwater, and poor rock quality. Wallace Group performed extensive settlement analyses and the results of the study reduced the requirement for deep over excavations.

Knott Landfill Cell 4, Deschutes County Department of Solid Waste, Bend, Oregon | Wallace Group (formerly Kleinfelder) provided geotechnical engineering design, excavation planning, disposal cell design, plans and specs, permitting/regulatory compliance, construction management services, and certification reporting for the design and construction management of Cell 4. We were able to meet an expedited design and permitting schedule that allowed the project to begin in the fall of 2006. Following completion of the project, a portion of the liner system was damaged by rock over-blast. We quickly responded to inspect, develop a work plan, and repair the liner.

Northwest Malheur Sage-Grouse Habitat Restoration EA (DOI-BLM-OR-V040- 2015-001-EA) for the Vale District BLM Rabe Consulting provided a Project Manager, NEPA Specialist and Writer/Editor who prepared the EA, coordinated the interdisciplinary team, provided documents for public scoping, prepared the comment response matrix, and managed the administrative record. Led field trips for public participation, questions and comments.

Cornerstone Industrial Minerals, Inc. Tucker Hill Perlite Mine Expansion Project EIS (DOI-BLM-ORWA-L050-2016-0001-EIS) for the Lakeview District BLM | Rabe Consulting provided a Project Manager, NEPA Specialist and Writer/Editor who prepared the EIS, scoping documents, and the comment response matrix. Rabe Consulting managed an external interdisciplinary team and coordinated with BLM resource specialists. This EIS was completed within the new guidelines for the BLM NEPA process including adherence to the completion timelines and page number limitation. This EIS was the first EIS nationally to undergo the new National review process.

Coffin Butte Landfill Expansion Project, Benton County, 2022-Present | AINW performed a cultural resource study in support of a landfill expansion, for review by Benton County, SHPO, Tribes, and the U.S. Army Corps of Engineers. The work was conducted under permit from SHPO and evaluated several archaeological sites. AINW recommended avoidance measures that would lead to a finding of No Adverse Effect. Benton County, SHPO and the Tribes all agreed with the finding of No Adverse Effect.

Sawyer Park Improvements, Bend, 2022-Present | AINW performed a cultural resource study in support of park improvements, for review by the Oregon Parks and Recreation Department and the National Park Service, SHPO, and Tribes. Under permit from SHPO, AINW evaluated an archaeological site and a historic park resource and recommended that the project would have an Adverse Effect on Historic Properties. AINW is currently developing a mitigation plan.

Gold Hill Sewer Intertie Project, Jackson County, 2023-Present | AINW performed a cultural resource study for a new pump station and sewer line, for review by the U.S. Department of Agriculture, SHPO, and Tribes. The in-progress fieldwork is documenting and evaluating archaeological and historic resources. The work has included obtaining a SHPO permit to conduct the archaeological work.

2.2 Project Team

As stated above, our Project Team consists of CEC, Transight Consulting, Blackmore Planning and Development, The Wallace Group, Archaeological Investigations Northwest, Rabe Consulting. A brief summary of key personnel resumes, which are presented in Appendix C, are as follows:

Civil & Environmental Consultants, Inc.

Mr. Jeff A. Shepherd, PE (OR PE No.: 92360) | Project Manager | Mr. Shepherd has more than 30 years of concentrated experience in solid waste engineering. He has extensive engineering and management experience associated with the planning, design, permitting, and construction of solid waste facilities. Mr. Shepherd has considerable experience in both private and public sectors. Mr. Shepherd has managed similar projects in Oregon, Oklahoma, New Mexico, Texas, and Arkansas. He has provided comprehensive design, permitting, and management services to the waste industry. In addition, he has permitted and designed solid waste landfills, construction and demolition landfills, composting facilities, and facility support areas (scale-house, scales, etc.). Mr. Shepherd will manage the entire Project Team and will be the main point of contact between DCDOSW and the Project Team. Mr. Shepherd will be the PE of record for any work completed by CEC. Mr. Shepherd will be working out of our Sacramento, CA office.

Ms. Lindsey Angell, PE (OR PE No.: 105510) | Principal in Charge | Mrs. Angell is Principal Solid Waste Engineer for CEC in the Sacramento, California office. She is a professional engineer and has over 10 years in experience in a variety of engineering, mining and environmental projects for the private and public sector in Oregon, California, Washington, and Nevada. She specializes in managing multi-year contracts with municipalities across Oregon and California providing a variety of design and support services including permitting, engineering design and regulatory compliance. Her project experience includes geotechnical site investigations and assessments, solid waste permitting and environmental compliance, design and analysis of

waste management units, construction management services, shallow and deep foundations, soil improvements, slope stability and earth retention systems.

Ms. Lisa Mash, PMP | BLM/Environmental Site Assessments | Ms. Mash has over 25 years of professional experience in the environmental consulting industry specializing in NEPA compliance, Endangered Species Act (ESA) Section 7 and 10 consultation, and environmental permitting support in coordination with U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS or Service), National Marine Fisheries Service (NMFS), Department of Housing and Urban Development (HUD), Department of Energy (DOE), BLM, and Federal Energy Regulatory Commission (FERC). As Senior Project Manager, Ms. Mash has had full responsibility for the successful completion of services in support of Environmental Impact Statements (EISs)/Environmental Assessments (EAs), Environmental Reviews (ERs), Critical Issues Analysis (CIA), and Biological Assessments (BAs) including oversight of a complex project team, work product development; coordination with lead agencies at the federal, state, and local level; and overall management of the environmental review process. Her extensive experience includes permitting and compliance for the construction and operation of natural gas and petroleum pipelines and storage facilities, transportation projects at the state and federal level, coastal restoration projects, marine terminals, power lines, water transmission and distribution facilities, landfill expansions, and master plan activities for municipalities.

Mr. Eric Scuoteguazza, MA, MBA, RPA (Registered Professional Archaeologist) | Cultural Resources Practice Lead | Mr. Scuoteguazza is recognized operations manager with over 30 years' experience conducting cultural resources investigations throughout the United States. Exceeding the professional requirements of the United States Secretary of Interior Standards (36 CFR 61), he specializes in the Section 106 compliance process and has served as a federally delegated compliance officer under the National Historic Preservation Act. Mr. Scuoteguazza has therefore acquired extensive training and experience in the federal historical compliance process, including all aspects of consultation and engagement with tribal organizations on behalf of various agencies. He is an expert-level practitioner of compliance procedures under various federal implementation codes. He has conducted numerous trainings and workshops on Tribal Consultation, public outreach, and Section 106 compliance. He has served as sole point of contact for tribal consultation (as a delegated federal agent for a large cultural resources program), as well as served as sole tribal liaison between federal agencies and tribal governments on numerous federal undertakings as a consultant. His expertise and experience include pragmatic regulatory strategy, working with tribal governments on community development initiatives, and developing programmatic agreements with tribal governments nationwide to establish proper tribal consultation procedure, many of which have been incorporated into US Federal Code. Mr. Scuoteguazza brings extensive experience to the team regarding consideration of historic resources and community involvement for preservation planning, and he has provided these skills on several community investment initiatives on behalf of tribal organizations and local communities.

Dr. Nick Shepherd, Ph.D., P.E. (Not currently registered in Oregon) | Landfill Permitting Manager
Dr. Shepherd has over a decade of experience conducting research in environmental engineering and environmental science. Primary responsibilities include field data collection, data management, statistical analyses, and preparing technical documents. Primary areas of experience include extensive experience in solid waste landfills. abandon mining projects including stream and biological assessments, groundwater and mine pool monitoring, surface water and mine drainage characterization, and sediment characterization; highwall and hazardous water body remediation; closure of C&D solid waste facilities; industrial stormwater design.

Transight Consulting, LLC

Mr. Joe Bessman, PE | Owner, Principal | Mr. Bessman is a registered professional civil engineer specializing in transportation engineering. He provides a breadth of experience within the transportation engineering field through his involvement in transportation planning, design, entitlements, and research projects over the past seventeen years. He has been involved in projects ranging from industrial, commercial, residential, institutional, and public facility uses. Joe recently worked with Deschutes County on the Senate Bill 1544 land swap in eastern Redmond and the County's Safety Campus in northern Bend. Joe brings an efficient and data-driven approach to his work, responding promptly and with actionable information for decision makers and the general public. Joe is the owner of Transight Consulting, LLC which is based out of Bend, Oregon.

Blackmore Planning and Development Services

Mr. Greg Blackmore | Owner, Principal | Mr. Blackmore is an experienced land use planner with over 15 years of planning and community development experience in Central Oregon. Greg has worked as a project manager for non-profit organizations, and as a Planner and Program Manager in the public sector, he has worked for large and small corporations, and he currently owns and manages a planning company in Bend. Mr. Blackmore has an expansive background in planning assignments, from project conception, design, and implementation, to application assistance, review, and decision-making. Mr. Blackmore has been on both sides of the planning counter, as he has worked with developers, with Planning Commissions, and with City Councils, and understands development issues from a variety of perspectives. He excels in identifying development challenges and working with developers and jurisdictions on creative solutions. Additionally, both as a City employee and as a private consultant, Greg has been involved in a number of high-profile projects and he understands challenges that can be unique to public entity development projects.

The Wallace Group, Inc.

Ms. Lisa M. Splitter, P.E., G.E. | Senior Geotechnical Engineer | Ms. Splitter has over 20 years of experience providing geotechnical engineering services including project management, construction observation, and subsurface investigations for various commercial, institutional, municipal solid waste, water, and transportation infrastructure projects throughout the western U.S. As a Lead Geotechnical Engineer and Project Manager, her experience includes coordinating subsurface investigations; performing engineering analyses including soil settlement, bearing capacity, pile capacity, seismic hazards, slope stability, deep excavation support, and lateral earth pressures; preparing reports; and managing construction projects. In addition, Ms. Splitter has experience in logging geotechnical borings, testing compaction of fill, observing the installation of deep foundations including driven and alternative piles and drilled piers, observing the construction of shoring systems, observing and testing temporary and permanent tiebacks, and checking the soil subgrade exposed in foundation excavations.

Mr. Scott Wallace, R.G., C.W.R.E. | Principal Hydrogeologist | Scott has over 36 years of applied consulting engineering and management experience in the geoscience industry. He is a recognized expert in the geologic systems of the Pacific Northwest, and his multi-disciplinary expertise includes groundwater hydrogeology, engineering geology, environmental compliance and permitting, remedial investigations/feasibility studies, geologic hazards, and water rights. He has served in a management and technical discipline lead role for private, public, and government clients on water resource projects for municipal supply, irrigation, fisheries, mining, and water storage throughout the western U.S. He advises clients on technical issues, writes and reviews technical reports and communications, provides expert witness testimony, and has served as a regulatory liaison at the federal, state, and local level.

Archaeological Investigations Northwest

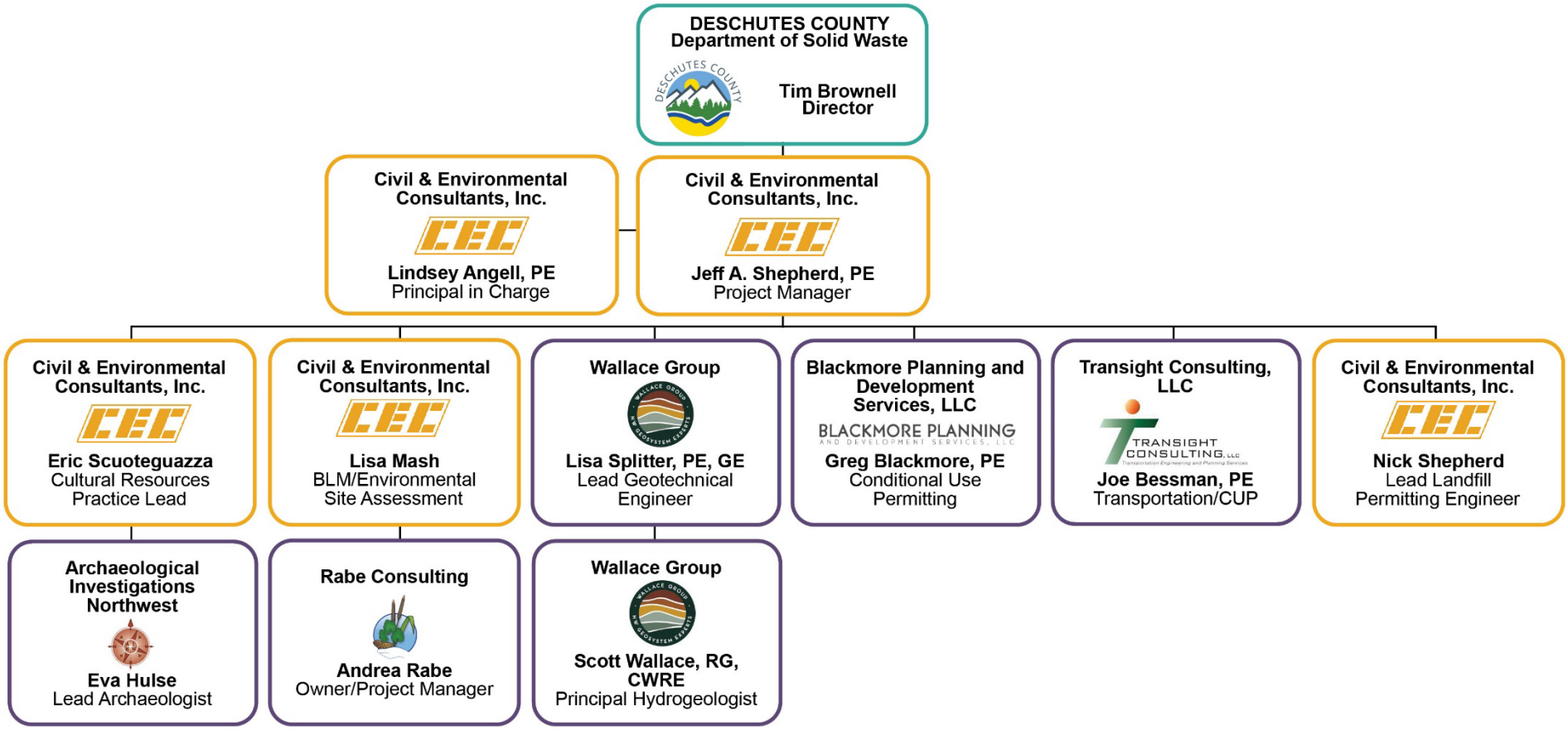
Ms. Eva Hulse | Project Manager | Eva L. Hulse, AINW Senior Geoarchaeologist, is a Registered Professional Archaeologist and meets the professional qualifications set forth in the Secretary of the Interior's Standards and Guidelines for Archaeology which are required for federally funded or permitted projects, and for projects needing review under state and local laws and guidelines. She has extensive experience with the reconstruction of geomorphic contexts of deeply-buried historic and prehistoric archaeological sites, with analysis of chemical residues in archaeological soils and sediments, and with GIS and LiDAR reconstruction of past landscapes. Eva has experience working on infrastructure and environmental cleanup projects throughout the Pacific Northwest. She is highly experienced with Oregon State Historic Preservation Office (SHPO) standards and guidelines, and with federal cultural resource regulatory compliance requirements for Section 106 of the National Historic Preservation Act (Section 106). Examples of project work listed below involved cultural resource assessments in Oregon.

Rabe Consulting

Ms. Andrea Rabe | Owner, Principal | Ms. Rabe MS, PWS, brings over 25 years of environmental planning as the owner and Senior Environmental Consultant at Rabe Consulting. As both a scientist and environmental specialist, Andréa provides technical experience to the Rabe Consulting team particularly in the areas of botany, wetlands, and environmental planning. Andrea Rabe will be the Project Manager, Botanist, and Wetland Scientist for this project. Andrea has worked on many large-scale projects with private developers, local municipalities, Bureau of Land Management, Bureau of Reclamation, and the US Forest Service as the Project Lead/Manager for Rabe Consulting.

Ms. Jessi Harris | Environmental Consultant | Ms. Harris is an environmental consultant that will be the main support on the environmental permitting process. Jessi has worked with Rabe Consulting on environmental permitting applications and reports. Jessi will also prepare the mitigation plans that are needed for the permitting process with input from Rabe Consulting's wildlife biologists and range specialists.

Project Organizational Chart



3.0 Scope of Work

The primary objective of the Landfill Siting Consultant Services - Phase 3 Project is to assist the County in securing the necessary permits, authorizations and land use entitlements required to develop and operate a MSW landfill on the Moon Pit property. The Project Team will strive to maintain open lines of communication with DCDOSW throughout the project so that critical issues are addressed quickly as they are identified, and unnecessary effort and expense is avoided. The Project Team's proposed project approach has been developed based on the collective experience and expertise of the Project Team. The Scope of Services for this project will be divided into 10 tasks as outlined in the RFP. The Project Team will work together to produce the engineering, environmental and permitting documents for the Moon Pit property for submittal to the necessary government agencies. This would include the Oregon Department of Environmental Quality (ODEQ), Deschutes County and Bureau of Land Management (BLM). As mentioned above, we have divided this scope of work into the following tasks:

Task 0100 – Planning
Task 0200 – Phase I Site Characterization Study
Task 0300 – Phase II Site Characterization Study
Task 0400 – Geotechnical Investigation
Task 0500 – Archaeological Study
Task 0600 – Permitting with Bureau of Land Management
Task 0700 – Land Use Entitlements and Permitting
Task 0800 – Permitting with Oregon Department of Environmental Quality
Task 0900 – Public Outreach and Meetings

TASK 0100 – Planning
The work associated with this task will include the activities necessary to complete the work associated with planning. This task will be divided into (2) two subtasks, which are:

Subtask 0101 – Review Existing Work and Site Conditions
Subtask 0102 – Scoping Meetings

Subtask 0101 – Review Existing Work and Site Conditions
Once contracts have been signed and approved, our Project Team will request all available information from DCDOSW. This would include any existing draft designs, layouts, and/or topographic information. We would also request anticipated waste disposal volumes for the proposed Moon Pit Site. Our Project Team will need to review existing site layouts and the incoming waste volumes so that we can develop a thorough understanding of the intended project. Once we receive that information, we will complete a thorough review and provide comments that will be presented at the Scoping Meetings in Subtask 0102.

Subtask 0102 – Scoping Meetings
Once we have completed the work associated with Subtask 0101, The Project Team will meet with DCDOSW. We anticipate at least three scoping meetings to occur to finalize the goals and objectives of the project. The first meeting, which will be in-person, will be to introduce the Project Team to the DCDOSW project team, outline lines of communication, review the scope of work for each task and discuss the goals and objectives for the project. Our Project Team will take notes during this first meeting and produce meeting minutes. Our Project Team will also produce a summary of the updated tasks (if necessary) and goals and objectives as outlined in the meeting. We will utilize these goals and objectives and produce some preliminary layouts using the existing conditions site topographic survey. These layouts will show the location of Phase 1 of the Moon Pit Landfill, entrance facility (including possible updates to Highway 20), the scale house facilities, utilities and any other items discussed in the first Scoping Meeting. We will then present these preliminary layouts at the second scoping meeting, which will be a virtual meeting. If DCDOSW agrees with the preliminary layouts, then the work under this subtask will be completed. If there are changes requested by the DCDOSW, then our Project Team will revise the preliminary layouts and will make another presentation at the third and final scoping meeting, which will also be a virtual meeting. Once we have approval of the preliminary layouts, our Project Team will move on to the other Tasks, which will be running concurrently. This includes Tasks 0200, 0500, 0600, 0700, 0900.

As required by the RFP, we have developed a Gantt Chart to show the schedule for completion of tasks, major milestones and submittal of deliverables which is included as Appendix B. We anticipate Task 0100 taking approximately 95 days to complete with project deliverables to include minutes from the scoping meetings and a final conceptual layout of Phase 1 of the Moon Pit Landfill project. Our cost estimate for Task 0100 is $48,700 (See Appendix A) and our assumptions for this cost estimate are listed in Section 4.0.

TASK 0200 – Phase I Site Characterization Study
The work associated with this task will be completed by CEC and The Wallace Group and it will build on the preliminary geologic and hydrogeologic work recently performed by the Parametrix team for the Moon Pit site screening process. The ODEQ regulation OAR 340-93-130(4) requires a soils, geology and hydrogeology report and a feasibility study report for a new landfill or an expansion of an existing landfill. OAR 340-94-080, OAR 340-40 and 40 CFR Part 258 address groundwater hydrology, quality and groundwater monitoring. The Phase I Site Characterization is the initial stage of data collection and establishes a preliminary framework for understanding the soils, geology and hydrogeology. Also, the purpose of the Phase I Site Characterization is to plan the Phase II Site Characterization. The main objectives of the Phase I site characterization study are to 1) describe existing site conditions; 2) determine if the site is suitable for landfill construction; and 3) provide sufficient base-

line information for developing the facility design, construction program, operations plan and environmental monitoring program. Based on our experience completing this type of work on other Oregon landfills, our Phase I Site Characterization Report will include detailed information on the following topics: 1) existing site conditions; 2) climate/meteorology; 3) hydrology; 4) water balance; 5) water use inventory; 6) geology and hydrogeology investigation; and 7) Phase II Site Characterization workplan.

As shown on the Gantt Chart included in Appendix B, we estimate that the work for Task 0200 will take approximately 45 days to complete and the deliverables for this task will be a Phase I Site Characterization Report and the Phase II Site Characterization Work Plan. The estimated cost for Task 0200 is $74,825 (see Appendix A).

TASK 0300 – Phase II Site Characterization Study

Once the Phase I Site Characterization has been completed and the work plan for the Phase II Site Characterization is submitted to the ODEQ and approved, CEC and The Wallace Group will complete the Phase II Site Characterization. Phase II Site Characterization evaluates subsurface conditions in greater detail including the depth and extent of the uppermost (water bearing) geologic units and hydraulically interconnected units, the lithologic and hydraulic properties of these units, groundwater flow patterns, and other factors. CEC and Wallace Group anticipate that the Phase II Site Characterizations will be defined with direct input from ODEQ and DCDOSW. The work for this task will be divided into the following subtasks.

Subtask 0301 – Surface Investigation
Subtask 0302 – Subsurface Investigation
Subtask 0303 – Hydrogeologic Testing
Subtask 0304 – Groundwater Quality Testing
Subtask 0305 – Phase II Site Characterization Report

Subtask 0301 – Surface Investigation

The work associated with this subtask will include CEC and Wallace Group personnel conducting the appropriate surface mapping and surface geophysical logging to generate surface geology information, provide a basis for subsurface exploration, and delineate areas of previous mining extraction and waste disposal activities (if needed). CEC and Wallace Group will map the site in sufficient detail to determine the areal distribution of surficial and bedrock units exposed across the entire site. Some of the practices and techniques used to obtain site-specific geologic and hydrogeologic data will be up-to-date, and consistent with industry-wide standards. Our work will conform to applicable American Society for Testing and Materials (ASTM) standards, and/or appropriate U.S. Environmental Protection Agency (U.S. EPA) or Department guidelines.

The deliverable for this subtask will include the necessary information to be included in the Phase II Site Characterization Report (Subtask 0305). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 60 days to complete.

Subtask 0302 – Subsurface Investigation

The work associated with this subtask will be completed by CEC and Wallace Group personnel. CEC and Wallace Group will determine the geology and hydrogeology beneath the site through subsurface exploratory methods. CEC and Wallace Group will select the appropriate method(s) of subsurface exploration for the Moon Pit site that will allow collection of representative samples of subsurface media. Borings will be completed, and monitoring wells installed to characterize the stratigraphy, and groundwater dynamics beneath the Moon Pit site. We propose to drill a minimum of three (3) and up to five (5) monitoring wells at representative locations near the perimeter of the Moon Pit site to collect subsurface geologic data and provide a well network to monitor the groundwater flow regime beneath the site. The subsurface investigation will include 30 borings (drilled as part of the Task 0400 – Geotechnical Investigation) and CEC and Wallace will perform field tests to determine the hydraulic gradient, hydraulic conductivity, transmissivity, groundwater flow direction and flow velocity for the uppermost aquifer system underlying the Moon Pit site. Based on existing on-site water well data, we anticipate the Moon Pit aquifer will be encountered at depths of approximately 900 to 1,000 feet below surface grade. We will describe and classify overburden soils, volcanic bedrock, interflow zones, and sedimentary deposits supplemented by appropriate laboratory tests on representative samples from each stratigraphic unit. We will prepare detailed geological logs of each boring incorporating relevant information, including photographic records of representative rock cores. CEC and Wallace Group will prepare the boring logs in accordance with ODEQ Solid Waste Landfill Guidance Document Section 3.0.

The deliverable for this subtask will include the necessary information to be included in the Phase II Site Characterization Report (Subtask 0305). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 90 days to complete.

Subtask 0303 – Hydrogeologic Testing

This subtask includes in-situ hydrogeologic testing to characterize the aquifer and develop a site-specific groundwater flow model for the 346-acre Moon Pit Property. We understand the existing on-site water well operated by Hooker Creek can pump at a sustained rate of approximately 1,000 gallons per minute (gpm) and as such, we anticipate the hydraulic conductivity and transmissivity of the aquifer to be relatively high. This will be confirmed by conducting an extended aquifer test of the existing Hooker Creek well with two (2) other existing on-site wells used as observation wells during the pumping test. We will also determine the unsaturated hydraulic conductivity and the vacuum pressure of unsaturated soils through field testing during monitoring well and geotechnical borehole installations. The testing elements for this subtask will be coordinated with input from ODEQ representatives to confirm compliance with applicable sections of ODEQ's August 24, 1992, guidance, "Groundwater Monitoring Well Drilling, Construction and Decommissioning."

The deliverable for this subtask will include the necessary information to be included in the Phase II Site Characterization Report (Subtask 0305). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 90 days to complete.

Subtask 0304 – Groundwater Quality Testing
This subtask will incorporate environmental groundwater testing and laboratory analyses representative of formation water to assess background environmental quality prior to waste placement. This work will be in accordance with ODEQ Solid Waste Landfill Guidance Document Section 3.5 methods, and table of constituents and parameters. We will incorporate existing groundwater quality sampling results performed by the Parametrix team for the Moon Pit site screening in October of 2023 from the active on-site water well to represent the northwest most location (downgradient). An additional groundwater sample will be collected from a proposed groundwater monitoring well in the southeast most location (upgradient) for comparison. In addition to the ODEQ Solid Waste Landfill Guidance Document Section 3.5 table of constituents and parameters, we recommend analysis for per-and polyfluoroalkyl substances as they become more regulated by the EPA.

The deliverable for this subtask will include the necessary information to be included in the Phase II Site Characterization Report (Subtask 0305). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 120 days to complete.

Subtask 0305 – Phase II Site Characterization Report
CEC and Wallace Group will prepare the Phase II Site Characterization Report that will describe the work performed during the fieldwork conducted as part of Subtasks 0301 through 0304. Geologic and hydrogeologic investigation will be performed under the direct supervision of a Registered Geologist (Mr. Scott Wallace) with current Oregon registration and with experience in conducting hydrogeologic investigations, in accordance with OAR 340-93-130. The Phase II Site Characterization Report will address, at a minimum, the information gathered through the work of Subtasks 0301 through 0304. The Phase II Site Characterization will follow the organizational format of the ODEQ Solid Waste Guidance Document Section 3.0, which will expedite ODEQ review of the report. The report will bear the stamp of the Registered Geologist who performed or supervised the investigation. The report will contain illustrations, including the following: 1) maps that will show the as-built location of all borings, monitoring wells and other sampling locations; 2) boring logs; 3) as-built well construction details; 4) geologic maps and cross sections; 5) water table or potentiometric surface maps for all major aquifers or water-bearing zones; and 6) geologic-structure contour maps depicting the soil-bedrock interface or other important subsurface features.

The deliverable for this subtask will be the draft and final Phase II Site Characterization Report. A draft copy will be submitted to DCDOSW within 60 days of the completion of the fieldwork associated with Subtasks 0301 through 0304. Once the draft Phase II Site Characterization Report has been reviewed by DCDOSW and we have received comments, we will make the necessary modifications and submit the Phase II Site Characterization Report to the ODEQ 45 days after receiving the comments. As shown on the Gantt Chart included in Appendix B, the work for this subtask is ongoing with the work from the other subtasks. It shows that the draft report will be submitted 420 days after the start of work for Task 0300. The final report will be submitted 465 days after the start of work for this task. The estimated cost for Task 0300 is $839,200.

TASK 0400 – Geotechnical Investigation
The work for this task will be completed by Wallace Group. The work for this task will be split into the following subtasks.

Subtask 0401 – Phase I Geotechnical Investigation
Subtask 0402 – Phase II Geotechnical Investigation
Subtask 0403 – Final Geotechnical Investigation Report

Subtask 0401 – Phase I Geotechnical Investigation
Wallace Group will utilize existing test pit data and supplement with additional exploration locations to conduct a preliminary geotechnical investigation designed to accomplish the following objectives: 1) characterize the variability, depth, aerial extent and engineering properties of onsite soils and other overburden deposits; 2) inventory soils and other overburden deposits suitable for use in construction and identify the proposed use for these materials; 3) identify geotechnical considerations (such as settlement and slope stability) which must be addressed in the engineering design and/or further characterized by a Phase II Geotechnical Investigation; and 4) develop a work plan for conducting a Phase II Geotechnical investigation, as necessary, to adequately characterize on-site soils and other geotechnical considerations. Wallace Group will complete a Phase I Geotechnical Investigation that will include the following:

- Fifty (50) test pit excavations;
- Geophysical survey, including three (3), 100-foot-deep ReMi shear wave velocity measurements and five (5), 200-foot-long seismic refraction profiles;
- Report summarizing stability of on-site materials, suitability of on-site materials for construction, and inventory of useable soils; and
- A Phase II Geotechnical Investigation Work Plan.

As part of the Phase I Geotechnical Investigation, Wallace Group will evaluate agricultural soil types and their distribution site-wide and within at least a one-mile radius of the site. At a minimum, prepare a soils map and describe the soils in the area. Basic data will be obtained from the U.S. Department of Agriculture Soil Conservation Service (SCS), and supplemented by additional site-specific reconnaissance or tests, as necessary, to confirm the accuracy and reliability of the SCS data.

The deliverable for this subtask will include the necessary information to be included in the Phase II Geotechnical Investigation Report (Subtask 0403). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 90 days to complete.

Subtask 0402 – Phase II Geotechnical Investigation
Once the workplan completed as part of the work for subtask 0401 has been approved by the ODEQ, Wallace Group will complete the Phase II Geotechnical Investigation, which will include:

Surface and Subsurface Exploration

- A surface evaluation will be performed to collect additional data to better extrapolate between subsurface explorations to generate a 3-dimensional model of ground conditions and for estimating rock excavation characteristics (quantity of rock that can be ripped versus quantities that require blasting).
- Subsurface evaluation using thirty (30) conventional drilled borings with rock coring, to depths ranging between 60 and 100 feet below ground surface (bgs).
- Downhole geophysics will be performed in six (6) borings around the perimeter of the landfill area, including acoustic or optical televiewer. Downhole geophysical surveys will be used to measure in-situ joint conditions and orientations that govern rock slope stability and rock excavation methods. Sonic caliper provides borehole breakout data that is also indicative of rock mass conditions.
- Drilled borings will evaluate the subsurface conditions, including the potential for lava tubes (voids) and soil inseams.
- Rock coring conditions and rock mass characterization will provide information about rock mass hydraulic conductivity, which will be used in the Phase II Final Geotechnical Report.
- Drilled borings will be used for geotechnical engineering data for the Phase II report and for use in the Phase II Site Investigation Report.

Wallace Group will perform laboratory testing on the soil and rock removed during the subsurface investigation program. These include the following:

- Rock core laboratory testing for shear strength of rock mass and joints for rock slope engineering.
- Rock core laboratory is anticipated to include the following methods:
    - Unit Weight (ISRM Method)
    - Direct Shear of Joint or Intact Rock (ASTM D5607)
    - Uniaxial Compression and Elastic Moduli of Rock (ASTM D7012 Method D)
    - Splitting Tensile Strength (ASTM D3967)
    - Point Load Index (ASTM D5731)
    - Slake Durability (ASTM D4644)

The deliverable for this subtask will include the necessary information to be included in the Phase II Site Characterization Report (Subtask 0403). As shown on the Gantt Chart included in Appendix B, the work associated with this subtask will take approximately 120 days to complete.

Subtask 0403 – Phase II Geotechnical Investigation Report
Once the field work and laboratory testing has been completed, Wallace Group will complete the Phase II Geotechnical Investigation Report. As part of this report, Wallace Group will evaluate the site to identify and characterize unstable conditions that could adversely impact facility structures. Wallace Group will perform stability analyses based on their geotechnical engineering expertise. The Phase II Geotechnical Investigation Report will include rock slope stability and the following:

- Summary of field exploration and laboratory data used to construct ground models for rock slope stability analysis and for estimating rock excavation conditions;
- Recommendations for ASCE 7-22 ground motion parameters;
- Rock mass characterization using surface geophysics, rock core and laboratory testing data that is the basis for estimating rock mass and joint strength, rock mass hydraulic conductivity, and rock excavation. The rock mass characterizations also help to estimate the reduction in strength and extent of this that may result should blasting be used for construction;
- Geotechnical analysis for rock slope stability:
    - Kinematic analysis to identify joint patterns that affect rock slope stability and rock excavation. Kinematic analysis will also include Markland-Test methods to identify plausible rock failure modes for further analysis; and
    - Limit-equilibrium analysis for the critical section for each rock cut. The limit equilibrium analyses will utilize software specific to the rock failure modes identified from the kinematic analyses and will consider conditions during construction, and the final configuration of the proposed excavation under both static and seismic conditions. Analyses will also consider rock reinforcing where required to meet the required factors of safety for these conditions.
- Geotechnical recommendations for design and construction:
    - Maximum inclinations for rock cuts that meet the required factors of safety;
    - Rock reinforcing alternatives and locations, where required;
    - General recommendations for rockfall catchment, where required;
    - Compressibility of underlying geologic units and potential settlement of the landfill; and

- Subgrade stability of underlying geologic units.

The deliverable for this task will be the draft and final versions of the Phase II Geotechnical Investigation Report. A draft copy will be submitted to DCDOSW within 60 days of the completion of the fieldwork associated with subtasks 0401 through 0404. Once the draft Phase II Geotechnical Investigation Report has been reviewed by DCDOSW and we have received comments, we will make the necessary corrections and submit the Phase II Geotechnical Investigation Report to the ODEQ 45 days after receiving the comments. As shown on the Gantt Chart included in Appendix B, the work for this subtask is ongoing with the work from the other subtasks. The draft report will be submitted 300 days after the start of work for Task 0400. The final report will be submitted 300 days after the start of work for this task. The estimated cost for Task 0400 is $905,000.

TASK 0500 –Archaeological Study

The work associated with this task will be completed by AINW with assistance from CEC. In order to complete the Land Use Entitlements permit, DCDOSW will have to comply with the county permitting process. For the landfill area, this will require consultation and review by the Oregon State Historic Preservation Office (SHPO) due to the potential for archaeological resources to be present within the landfill area, as identified during the archaeological study for the site selection process. Also, since the current access road is on BLM property, this will require consultation and review by BLM (Federal permitting authority), as well as a permit under the Archaeological Resources Protection Act (ARPA). Furthermore, the Moon Pit property is adjacent to a large and important archaeological site which may extend into the landfill area. The Moon Pit property is currently on private land and no federal funding is anticipated. The land will presumably be transferred to Deschutes County ownership prior to initiation of the archaeological study. The site selection documents indicate that no known historic resources are present within the landfill area and a historic resource survey will not be needed. The below subtasks address permitting and archaeological compliance needed during this phase of the project. This Task will be divided into 5 subtasks, which are as follows:

Subtask 0501 – Coordination
Subtask 0502 – SHPO and ARPA Permitting
Subtask 0503 – Archaeological Survey for Moon Pit Property
Subtask 0504 – Archaeological Survey for BLM Access Road
Subtask 0505 – Reporting
Subtask 0506 – Excavations to Evaluate Archaeological Sites

Subtask 0501 – Coordination

There will be design team meetings and status meetings to review archaeological results and recommendations. CEC and AINW recommend advance coordination with Tribes and can assist with this outreach. There are no deliverables for this subtask. As shown on the Gantt Chart in Appendix B, the work for this subtask should take about 30 days.

Subtask 0502 – SHPO and ARPA Permitting

The work under this subtask will include activities necessary to prepare a SHPO permit application for the Moon Pit Landfill Site and an ARPA permit application for the BLM access road area. The work for this subtask will be carried out by AINW with assistance from CEC. The site evaluation documents provided by the County recommend a SHPO permit for delineation of archaeological resources. However, they do not make any recommendation about performing an archaeological survey and obtaining the correct permit for the BLM access road. At the time of this response to the RFP, the Moon Pit property is privately owned, and Deschutes County will most likely be purchasing the property from the current owner. A SHPO permit is required for the current owner of the property. It would be cost effective if Deschutes County was to purchase the property prior to the initiation of the SHPO permit so that one permit can be obtained in Deschutes County's name. If the SHPO permit has been obtained in the current owner's name and Deschutes County purchases the property during that process a new SHPO permit would be required. Therefore, CEC and AINW are recommending that one SHPO permit be obtained in order to simplify the permitting process.

Furthermore, we understand that access road improvements will be needed, and the access road is located on BLM land. CEC and AINW will obtain an ARPA permit from BLM rather than the SHPO permit. Archeological investigations on Federal lands that are not carried out by federal archeologists must be conducted under a Permit for Archeological Investigations, per ARPA. Some agencies also cite their own authorizing law(s) as an authority to issue archeological investigation permits.

The deliverables for this subtask include a draft work plan for review by Deschutes County and the final permit application submitted to SHPO and BLM by CEC and AINW. As shown on the Gantt Chart in Appendix B, the work for this subtask should take about 120 days.

Subtask 0503 – Archaeological Survey for Moon Pit Property

Under this subtask, AINW with assistance from CEC, will conduct an archaeological survey of the landfill area of the Moon Pit property, which is approximately 560 acres. However, as per information provided by Deschutes County, a portion of the landfill project area have been surveyed for archaeological resources prior to the reconnaissance conducted for the current project. These surveyed areas have been disturbed by quarry activities, had no reported archaeological discoveries, and will not need to be re-surveyed. This reduces the area to be surveyed by AINW to approximately 250 acres. The site evaluation documents provided by the County note that five archaeological resources were found during the site selection process. These are not yet formally recorded with SHPO, and the area to be surveyed (250 acres) has a high probability of archaeological resources. The site selection documents recommend a full pedestrian survey and shovel testing of undisturbed portions of the landfill area. AINW anticipates that three archaeological sites and two archaeological isolates will be found within the survey area and if additional archaeological resources are found, a contract modification will be requested by CEC and AINW to address the

additional documentation effort. As mentioned above, AINW and CEC are proposing to conduct a full walkover of the undisturbed terrain (approximately 250 acres) to inspect the surface for archaeological resources. A reconnaissance-level inspection will be conducted on portions of the active quarries that have not been previously surveyed (part of the 250 acres). AINW anticipates up to 150 shovel tests will be excavated in areas with a high probability of archaeological discovery. The shovel tests will be 12-inches by 12-inches and will be excavated to 20-inches below the surface or deeper as warranted. The soil removed from the shovel pit will be screened through 1/4-inch by 1/8-inch mesh hardware cloth. The shovel pits will be backfilled immediately upon completion. Up to 50 artifacts will be collected and curated at the Oregon Museum of Natural and Cultural History under the terms of the SHPO permit.

The deliverables for this subtask include AINW with assistance from CEC, submitting artifact photos to Tribes on behalf of the project and CEC and AINW will submit final curation paperwork to SHPO under the terms of the permit. As shown on the Gantt Chart the work for this subtask will take about 60 days to complete.

Subtask 0504: Archaeological Survey for BLM Access Road
The existing access road to the proposed landfill will need to be improved to accommodate increased vehicle traffic. The access road measures just over 1 mile in length and crosses land owned by the BLM. An archaeological survey is needed in support of the road improvements and the ARPA permit acquired as part of the work in subtask 0502 will support this work. AINW with assistance from CEC, will conduct a full walkover of the undisturbed terrain that may be impacted by the road improvements to inspect the surface for archaeological resources. CEC and AINW assume that no archaeological discoveries will be found in the area of the access road improvements. If archaeological resources are found, a contract modification will be requested by CEC and AINW to address the additional documentation effort. CEC and AINW anticipate up to 40 shovel tests will be excavated in areas with a high probability of an archaeological discovery. Shovel tests will be 12-inches by 12-inches at the surface and will be excavated to 20-inches below the surface or deeper, if warranted. Soils will be screened through 1/4-inch and 1/8-inch mesh hardware cloth. Shovel tests will be backfilled immediately upon completion.

The deliverables for this subtask will be a final report of the survey results submitted draft to Deschutes County for their review and approval prior to submitting the report final to BLM. As shown on the Gantt Chart the work for this subtask will take about 60 days to complete.

Subtask 0505 – Reporting
SHPO will require an archaeological survey report describing the methods and findings of the archaeological survey. AINW with assistance from CEC, will complete the archaeological survey report for review by Deschutes County and then will be finalized for submittal to SHPO.

The deliverables for this subtask include the draft version of the archaeological survey report with up to 10 site forms for review by Deschutes County and then a final version of the archaeological survey report with up to 10 site forms appended for submittal to SHPO. CEC and AINW will submit the final report to SHPO and Tribes on behalf of Deschutes County. According to the Gantt Chart the work for this subtask will take about 90 days to complete.

Subtask 0506 – Excavations to Evaluate Archaeological Sites
Three archaeological sites and two archaeological isolates are known to be within the project area and cannot be avoided by the project. The two isolates are unlikely to be significant. The three archaeological sites must be evaluated through archaeological excavation. Quarter test unit excavations (QTUs) will measure 0.5 x 0.5 meter (1.6 x 1.6-feet) in size and be excavated to the depth of the archaeological deposit. Two or more QTUs may be joined together to make larger units as appropriate. All soils would be screened through 1/4-inch and 1/8-inch hardware mesh, and all artifacts would be collected and taken to AINW's laboratory for analysis and curation. As appropriate, artifacts will be sent to outside laboratories for specialized analyses such as radiocarbon dating and obsidian sourcing. AINW will use the gathered data to recommend steps to minimize impacts to significant resources. The results will be summarized in an excavation report for submittal to SHPO and Tribes.

The deliverables for this subtask will include a draft excavation report with appended SHPO site forms for evaluated archaeological sites for review by Deschutes County. A final excavation report with appended SHPO site forms for evaluated archaeological sites will then be submitted to SHPO. Also, results of outside lab analyses will be included in the draft and final reports. Furthermore, CEC and AINW will submit the final report to SHPO and Tribes on behalf of the project. According to the attached Gantt Chart the work for this subtask will take approximately 90 days to complete.

As shown on the Gantt Chart in Appendix B, Task 0500 is estimated to take approximately 390 days to complete, and our estimated cost is $278,000.

TASK 0600 – Permitting with Bureau of Land Management
The work associated with this task will be completed by CEC and Rabe Consulting. Rabe Consulting will be responsible for fieldwork and preparation of mitigation plans and CEC will be responsible for completing the Environmental Assessment as required by BLM. This task will be split into 6 subtasks, which are as follows:

Subtask 0601 – Environmental Surveys
Subtask 0602 – Greater Sage Grouse Mitigation Plan
Subtask 0603 – NEPA Support
Subtask 0604 – Wetland Memo (if needed)
Subtask 0605 – Environmental Permitting Support
Subtask 0606 – Agency Coordination/Environmental Assessment

Subtask 0601 – Environmental Surveys
Rabe Consulting will conduct an on-site field review to identify potential streams, wetlands, swales, ditches, ponds, seeps, springs, and other above ground aquatic resources; to identify the presence of protected species and/or potential suitable habitat, assess habitat conditions for greater sage-grouse; and document the presence/absence of potential invasive species at the Moon Pit site. No additional species-specific surveys are anticipated at this time. If appropriate, Rabe Consulting can provide a separate cost proposal for those additional services. The results of the on-site field review will be summarized in a report including survey methods, survey results, photographs, data forms and maps.

Subtask 0602 – Greater Sage Grouse Mitigation Plan
Rabe Consulting will prepare a mitigation plan for the Greater Sage Grouse which is considered a sensitive species to address project impacts to their habitat in accordance with Greater Sage Grouse Area Combining Zone (DCC 18.89.060). The Combining Zone addresses impacts to sage grouse habitat in accordance with the State of Oregon's requirements for protection of sage grouse. The mitigation plan will identify project impacts to the habitat and specify mitigation measures and offsets for the impacts.

Subtask 0603 – NEPA Support
Rabe Consulting will support CEC with preparation of the NEPA document, assumed to be an Environmental Assessment (EA), by providing the technical reports necessary to help analyze the potential effects on environment resources including Areas of Critical Environmental Concern; threatened, endangered or candidate plant or animal species; wetlands/riparian zones; and invasive non-native species.

Subtask 0604 – Wetland Memo (if needed)
If wetlands are identified during the on-site field review of the Moon Pit site, then Rabe Consulting will prepare a memo for the County describing the findings and conclusions regarding wetlands, if such a memo is needed for permitting support.

Subtask 0605 – Environmental Permitting Support
Rabe Consulting will assist CEC with the below permitting processes:

- Eagle Incidental Take Permit through the US Fish and Wildlife Service;
- Oregon Department of Fish and Wildlife (ODFW) Wildlife Habitat Mitigation Policy (OAR 635-415-0000) to address Goal 5 Resources (Elk Winter Range, Deer Winter Range);
- Wildlife Area Combining Zone (18.88.030) to address impacts from development in important wildlife areas and to design development to be compatible with the protection of wildlife areas;

Rabe Consulting will help with preparation of the permit applications including any mitigation for submittal to the respective resource agencies. A mitigation plan will be prepared for the ODFW Wildlife Habitat Mitigation Policy and will provide compensatory mitigation for the Greater Sage Grouse Area Combining Zone.

Subtask 0606 – Agency Coordination/Environmental Assessment
Due to the scope of this Project, CEC anticipates the involvement of multiple agencies during preparation of the EA document. Our team has established working relationships with the BLM Prineville District Office, U.S. Fish and Wildlife Service (USFWS), Oregon Department of Fish and Wildlife, Oregon DEQ, and other agencies. CEC and Rabe Consulting will assist the County with preparation of the Federal and State agency consultation letters describing the proposed project and requesting review and comment of the project as it relates to areas of their interest or concern. CEC will prepare a draft version of these letters for the County to review and incorporate any revisions. CEC will then finalize the letters and submit them electronically to the agencies.

Per the Council of Environmental Quality directive, NEPA requires that all federal agencies consider the effects on the environment prior to the approval of any major federal actions (construction), federal permitting, or projects receiving federal funding. For the proposed landfill expansion, the Moon Pit site's access road crosses BLM lands; therefore, the lead agency has been identified as BLM. As per the RFP, DCDOSW will need a new right of way (ROW) easement across BLM lands. This will require NEPA and land use policy compliance reviews. The CEC team is known for completing complex impact analyses and inter-agency and stakeholder consultations as part of the NEPA process. We excel at conducting environmental impact assessments and regulatory compliance and maintain up to date knowledge of federal, state, and local laws and regulations to be able to evaluate the project's ability to comply with each appropriate statute, executive order and/or regulation (i.e., Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and Section 404 of the Clean Water Act).

Prior to initiating the NEPA review process, CEC will coordinate a pre-application conference call with the BLM, Prineville District, Deschutes Field Office to discuss the anticipated requirements for the portion of the proposed project on BLM lands. CEC will then prepare an Application for Transportation, Utility Systems, Telecommunications and Facilities on Federal Lands and Property (SF-299) for submittal to BLM. The level of environmental analysis required is anticipated to be an Environmental Assessment (EA). CEC will coordinate with BLM to initiate the NEPA compliance review process. For preparation of the EA, CEC will follow the BLM EA template and include the following information:

- Introduction (Summary of Proposed Project, Purpose and Need, Land Use Plan Conformation, Issues Identified for Analysis and Issues Identified but Eliminated for Further Analysis);
- Evaluation of Alternatives (including the No Action Alternative);
- Affected Environment and Environmental Consequences for each Resource Issue (including an analysis on Cumulative Effects and Residual Impacts after mitigation);
- Consultation and Coordination (including Summary of Public Participation and Public Comments Analysis); and

- Appendices (to include a List of Preparers, maps, figures, tables, references, and any supporting documentation/technical reports).

For the Affected Environment and Environmental Consequences chapter in the EA, CEC will provide a discussion on the associated regulatory framework, the existing site conditions, and the potential impacts that each alternative could have on the identified resources. When mitigation is appropriate to avoid or reduce adverse impacts, these measures will also be described. CEC will prepare the Draft EA document for Deschutes County review. When approved for distribution, the EA will be provided to BLM for review. CEC will assist Deschutes County in conducting the required agency coordination and to prepare a clear and concise EA with the objective of obtaining a fully executed Finding of No Significant Impact (FONSI). The deliverable for this task will be a completed Environmental Assessment. As shown on the Gantt Chart in Appendix B, we have estimated that this task will take 576 days to complete and the estimated cost is $99,350.

TASK 0700 – Land Use Entitlements and Permitting
The process of obtaining Land Use Entitlements and Permits is a multifaceted task that involves a series of steps to ensure compliance with various regulations and requirements. The collaboration between CEC, Transight, and Blackmore Planning will encompass the preparation of a conditional use permit application, which is essential for acquiring the Land Use Compatibility Statement from the ODEQ. Given the site's reliance on US 20 for landfill access, adherence to ODOT's Change of Use criteria as outlined in Division 51 (OAR 734-051-3020) is crucial. This is particularly significant if the conversion from a surface mining operation to a landfill result in an increase in traffic, specifically more than ten Class 7 trucks per day, which would necessitate additional infrastructure such as a left-turn lane at the entrance. Should a Change of Use be determined, a re-application for the shared US 20 approach may be required, a process that can be extensive, especially within ODOT Region 4. The task at hand is systematically divided into six subtasks to streamline the process and ensure each aspect is addressed thoroughly and in accordance with all regulatory standards.

Subtask 0701 – Land Use Strategy Meetings
Subtask 0702 – Field Review
Subtask 0703 – Data Collection and Compilation
Subtask 0704 – Prepare Required Submittal Materials for Conditional Use Permit Application
Subtask 0705 – CUP Application Support
Subtask 0706 – Project Hearings and Meeting Support
Subtask 0707 – Internal Coordination Meetings

Subtask 0701 – Land Use Strategy Meetings
The Moon Pit site presents a complex zoning scenario, with its current designation as Surface Mining (SM) and the overlay of a Wildlife Area (WA), which is further complicated by adjacent zones of varied nature and purpose. The active surface mine's operation is permissible within the SM zone, yet the establishment of a Land Disposal Site is contingent upon the existence of a valid ODEQ permit, as stipulated by Ordinance No. 92-066. Without an operational landfill, the land disposal remains outside the scope of permitted activities in the current zoning framework. The report from Parametrix, dated January 29, 2024, offers alternative pathways for land use modification, which necessitates a collaborative effort with the Deschutes County Department of Solid Waste (DCDOSW) and the County Planning and Development. The anticipated "road map" will be instrumental in navigating the intricate land use process, ensuring that any proposed changes align with regulatory requirements and environmental considerations. This strategic planning will involve in-depth discussions and meetings with relevant stakeholders to finalize the most suitable land use process approach. We are anticipating four meetings as part of this subtask. Attendance at this meeting would be representatives of DCDOSW, Deschutes County Planning and Development, CEC, Blackmore Planning and Transight. As a team, we would work together to determine the best course of action for changing the land use of the Moon Pit site.

The deliverable for this subtask would be meeting minutes from each meeting and the final approach as approved by the team. As shown on the attached Gantt Chart, the estimated time to complete this subtask will be approximately 69 days.

Subtask 0702 – Field Review
The field review will be completed by CEC, Blackmore Planning and Transight. The primary area of focus during the field review will be the skewed and slightly offset intersection with Horse Ridge Frontage Road to the south; it is assumed that some improvements will be required at the entrance to improve the access for heavy trucks and separate the BLM parking lot from the landfill operations. Coordination with BLM will be required and is included in Task 0600.

Deliverables for this subtask will include a summary of the field review notes presented to Deschutes County. As shown on the Gantt Chart, this work should take approximately 12 days to complete.

Subtask 0703 – Data Collection and Compilation
Data collection and compilation will be conducted by Transight. An expected concern from the public will be related to the safety of the US 20 connection and impacts to recreational access to the nearby BLM lands, particularly with the Dry River alignment nearby and Badlands Rock Trail extending through the property. Based on aerial review it appears that the BLM parking occurs in two areas along the access route. Transight recommends conducting data collection with automated tube counts over a period of 7 days when the trails are seasonally open (we believe some of these trails close seasonally for wildlife protection), and this data will also capture the volumes and speeds along US 20.

There will be no deliverables for this subtask as this data will be included in the final report that will be submitted with the Land Use Permit application. As shown on the Gantt Chart, this work will take approximately 120 days to complete.

Subtask 0704 – Prepare Required Submittal Materials for the Conditional Use Permit Application
The completion of subtask 0701 will necessitate the submission of a Conditional Use Permit (CUP) application to Deschutes County Planning and Development. This is a critical step to secure permission for landfill operations at the Moon Pit site. The process will likely involve a text amendment or zone change compliance report as part of the CUP application. Additionally, adherence to the Transportation Planning Rule is mandatory, which will require coordination with the Oregon Department of Transportation (ODOT). A new permit application may be needed for the enhancement of the US 20 connection. Furthermore, a comprehensive Site Traffic Report will be essential to meet the county's stipulations. All documentation should be thoroughly reviewed and approved by the project team before submission. The following items will support the conditional use permitting process: ensuring compliance with local zoning regulations, coordinating with ODOT for transportation planning, and preparing a detailed Site Traffic Report.

- We will review the existing land use regulations, past decisions and applications that might impact this project;
- We will review the conceptual designs completed as part of Task 0800 and verify that those designs are acceptable for submitting in the Conditional Use Permitting process. These drawings would be the overall boundary of the Moon Pit Site, entrance facility, design details for US 20 and preliminary design details for the proposed landfill;
- We will submit the Land Use Permit application to Deschutes County Planning and Development. The application would include a 1) a completed application form; 2) a copy of the deed showing current ownership of the property; 3) a written statement and other documentation that shows how the applicable standards will be met; and 4) the Land Use Permit application drawings;
- We will conduct a pre-application meeting with Deschutes County Planning and Development. This meeting will be attended by CEC, Blackmore, Transight Consulting and personnel from DCDOSW;
- We will prepare the Burden of Proof narrative to address compliance with the applicable criteria, including, but not limited to, the Development Code, Comprehensive Plan and Statewide Planning Goals; and
- We will collect and post the Land Use Action notification sign; and
- We will submit the Conditional Use Permit Application including the Burden of Proof.

The deliverable for this subtask will include a draft report submitted to Deschutes County for review and approval. Following the receipt of comments from Deschutes County, a final report will be completed and submitted to Deschutes County for inclusion in the Land Use Permit application. As shown on the Gantt Chart this work will take approximately 60 days to complete the Land Use Permit application document with review and revisions by DCDOSW. This estimation of time does not include responding to comments from Deschutes County Planning and Development. However, it does include the regulatory time needed for Deschutes County Planning and Development to approve or deny the Land Use Permit application.

Subtask 0705 – Conditional Use Permit Application Support
The work associated with this subtask will be for activities after the conditional use permit application is submitted. Deschutes County Planning and Development will review the permit application and will issue comments within 30 days. These comments will be in reference to the overall completion of the permit application. If documentation is missing, or we need to submit additional information then this is the opportunity to complete that submittal. Once that information is submitted, the County will deem the application complete and the 150-day timeline starts for the technical review, approval of the application by County staff, vote by the planning commission and approval by the Board of Commissioners. After the completion review, we anticipate submitting other documents as requested by the Planning and Development department and/or the planning commission.

Subtask 0706 – Project Hearings and Meeting Support
The work associated with this subtask includes Transight and Blackmore Planning attending the required Land Use Permit application hearings. These hearings are different than the planned monthly meetings as discussed in Task 0900 Public Outreach and Meetings. We are anticipating that there will be 2 hearings associated with the Land Use Permit process.

The deliverables for this subtask will include attendance at the two planned public hearings.

The overall cost estimate for Task 0700 is $127,000 and we estimate that the work for this task will take 1,132 days. This includes the text amendment change indicated by Parametrix in their “Deschutes County Solid Waste Management Facility (SWMF) Final Site Evaluation Report” dated May 2024. Parametrix estimated that the text amendment would take approximately 2 years to complete.

TASK 0800 – Complete Permitting with Oregon Department of Environmental Quality
The work associated with this task will mostly be completed by CEC with input from other Team members. The work completed under this task will be for the development of the ODEQ permitting and design documents that will be submitted to obtain a solid waste landfill permit to operate the landfill at the Moon Pit property. CEC will create a Site Development Plan (SDP) that will provide the framework for facility design, construction, operation, and environmental monitoring. CEC will prepare a comprehensive SDP that presents the conceptual design of landfill facilities and environmental control systems and documents the analysis used to select the proposed technologies. The plan will be prepared under the direct supervision of Jeff Shepherd (OR PE No.: 92360). CEC is under the assumption that DCDOSW will provide the AutoCAD files of the design completed by Parametrix during the Site Location phase of this project. This preliminary design will form the basis of our design which would be updated based on geotechnical, geological and hydrogeological concerns outlined in Tasks 0200, 0300 and 0400. CEC will refine that design but more importantly we will convert this design to meet the elements of the SDP, including: 1) facility operation;

2) conceptual design of landfill facilities; 3) leachate management; 4) surface water management; 5) landfill gas management; 6) environmental monitoring; 7) closure and end use; and finally 8) supporting information.

This task has been divided into the following subtasks:

Subtask 0801 – Location Restrictions
Subtask 0802 – Site Development and Layout
Subtask 0803 – Liner System Design
Subtask 0804 – Primary and Secondary Leachate Collection System Design
Subtask 0805 – Stormwater Management Design
Subtask 0806 – Final Cover System Design
Subtask 0807 – Site Operation Plan
Subtask 0808 – QA/QC Plan
Subtask 0809 – Environmental Monitoring Plan
Subtask 0810 – Closure and Post-Closure Plan
Subtask 0811 – Other ODEQ Permits

Subtask 0801 – Location Restrictions

The services associated with this subtask will include those activities necessary to complete the location restriction study for the Moon Pit Landfill. The ODEQ solid waste guidance document lists the following location restrictions that new landfills must comply with: 1) airport safety; 2) floodplains; 3) wetlands; 4) fault areas; 5) seismic impact zones; 6) unstable areas; 7) critical habitat; and 8) sensitive hydrogeological environments.

CEC will review each restriction above and provide a detailed response for each item. Some of the information will be obtained after the Phase I/II site characterizations are completed (see Tasks 0200 and 0300). Our work will be summarized in a report that will be ultimately inserted into the final permit application document that will be submitted to the ODEQ. Those areas where insufficient data exists to adequately satisfy the ODEQ requirement will be noted for additional study/analysis.

Subtask 0802 – Site Development and Layout

CEC understands that the Moon Pit Landfill was conceptually designed during the Site Location portion of this project. We are assuming that DCDOSW will provide those drawings to us in AutoCAD format. This will allow us to have a basis for the design work to be completed under this subtask. The work associated with this subtask will include all activities needed to design the landfill subgrade, top of protective cover, top of waste, top of final cover and the phased development of the Moon Pit Landfill. The design work undertaken for this subtask will address the following elements: 1) the design criteria used to determine the landfill's size, configuration, capacity, location, and environmental protection features; 2) design, construction, and operation considerations for initial cell development; 3) individual cell construction and the fill sequence; 4) slope stability in relation to construction, fill sequence, and side-slope liner design; 5) facility development drawings; 6) utility requirements including electrical power, water supply, and wastewater treatment and disposal; 7) earthwork materials for site construction and development; and 8) environmental control technologies. CEC will prepare a series of scaled drawings showing the phased development of the site. We will show each phase of landfill cell(s) development and site status when new cells are ready to be placed into service. The drawings will include at least one scaled plan-view and two perpendicular cross-sectional drawings of the excavation plan, a fill sequence plan, and final grading plan. The following information will be included on the drawings: 1) environmental monitoring components including groundwater monitoring wells, and gas monitoring probes, and surface water monitoring stations; 2) layout of landfill components including support facilities (e.g., public receiving and recycling areas); 3) entrance and on-site roads, gates and fencing; 4) site drainage and surface water control structures (e.g., berms, dikes, ditches, culverts); 5) surface impoundments; 6) soil stockpiles (i.e., the extent, available volume, and intended use of each soil, sub-soil, or rock unit identified as a borrow source); 7) leachate collection, storage, treatment and disposal facilities; 8) special waste management areas (e.g., tires, bulky wastes, asbestos); 9) planned total landfill footprint including buffer zones, landscaping, and site screening features; 10) planned excavations and base grades for each major phase of site development, relationship to hydrogeologic features (e.g., water table profile, water bearing formations); 11) configuration of the completed landfill and final grading plan; 12) the final landfill surface profile and its internal components, existing topography, and underlying geology/hydrogeology (in landfill cross-section views); and 13) gas control system components.

The deliverables for this subtask are scaled engineering drawings that will be included in the Permit Application Document.

Subtask 0803 – Liner System Design

The work completed under this subtask will include all the activities necessary to design the liner system for the Moon Pit Landfill. CEC understands the ODEQ standard composite liner design incorporates a two-foot-thick soil layer with a maximum permeability of 1 $x10^{-7}$ cm/sec and a geomembrane layer with a minimum thickness of 60 mil for HDPE Geomembrane or 30 mil for other materials. CEC further understands, the Moon Pit Landfill will most likely require a geosynthetic clay liner instead of the 2-foot-thick soil liner as there is not sufficient soils on site to meet this requirement. Therefore, CEC will have to propose an alternative liner design and comply with the ODEQ's Alternative Liner Design Demonstration. We understand that the demonstration will be made to the Director of the Department that the proposed design will: 1) meet the performance standard in 40 CFR 258.40(a)(1); and 2) comply with the policies and specific performance requirements of Oregon's Groundwater Quality Protection Rules (i.e., prevent a leachate release exceeding the statistical background concentrations at the relevant point of compliance). Therefore, our design work under this subtask will include the following: 1) the alternative liner demonstration as outlined above; 2) anchor trench, puncture, filtration, and calculations; 3) slope stability calculations for global waste stability, liner veneer stability, and construction stability; 4) laboratory testing of the proposed liner materials and 5) for the HDPE

Geomembrane component, we will perform calculations to show that it is chemical compatible with leachate, landfill gas and other expected environmental conditions, that it is capable of withstanding the anticipated short-term and long-term stresses due at the landfill, and the friction properties are compatible with other components of the liner system.

The deliverable for this subtask is an engineering design report that includes: 1) executive summary, conclusions, recommendations; 2) design basis, main assumptions, design criteria, and site constraints; 3) descriptions of key landfill components and their design functions; 4) a written explanation of the detailed design drawings and specifications; 5) a demonstration that landfill components will function as designed; 6) results of design-related materials testing; 7) preliminary specifications for construction materials; and 8) engineering analyses and calculations used to develop the design. This design report will be included in the Permit Application Document.

Subtask 0804 – Primary and Secondary Leachate Collection System Design

The work completed under this subtask will include all of the activities necessary to design the primary leachate collection system and removal system and the leachate management system as well as the secondary leachate collection and removal system. CEC understands that the primary leachate collection and removal system (LCRS) must be designed to function automatically, continuously, and as efficiently as possible within practical limits. The LCRS should maintain a leachate depth of less than 12-inches (30-cm) above the liner. We further understand that the ODEQ, under certain circumstances (OAR 340-94-060(6)), may require a secondary leachate collection and removal system to provide for additional groundwater protection and/or enhanced monitoring. We are under the assumption that the ODEQ will require some sort of secondary leachate collection and removal system for the Moon Pit Landfill. Therefore, the work under this subtask will include the design calculations for the primary leachate collection layer, primary leachate collection piping, primary leachate collection sump, primary sump riser pipes, primary leachate pumps, primary leachate forcemain and primary leachate storage facilities. Our design work shall be in accordance with the following design criteria: 1) granular drainage layer percent fines with less than 5% passing No. 200 sieve; 2) granular drainage layer hydraulic conductivity shall be greater than 1×10^{-2} cm/sec; 3) granular drainage material should consist of carbonate-free, rounded gravel or non-angular rock 4) leachate collection pipe shall be a minimum 6-inch diameter, schedule 80 or equivalent strength pipe; 5) minimum slopes for collection pipes shall be 1% after predicted settlement; comply with OAR 340-52-030 for sewer pipelines (enough slope to maintain scouring velocity); 6) minimum slopes for leachate drainage layer shall be 2% after foundation settlement; 7) manhole/cleanout spacing shall be compatible with available cleanout equipment and meet recommendations (not minimums) of OAR 340-52-030 for sewer pipes. At a minimum, provide cleanouts at both ends of all leachate collection pipes and sweep bends to accommodate cleanout equipment. Our design work for the secondary leachate collection and removal system will be in accordance with the following design criteria: 1) beneath areas of maximum leak probability; 2) directly below and parallel to the liner system; 3) above or hydraulically isolated from the seasonal-high water table to prevent groundwater intrusion into the secondary leachate collection and removal system and potentially erroneous monitoring results; 4) granular drainage layer percent fines shall be less than 5% passing No. 200 sieve; 5) granular drainage layer hydraulic conductivity shall be greater than 1 cm/sec (at field density); 6) granular drainage layer physical properties shall be non-angular rock or rounded gravel free of carbonate material; 7) geosynthetic drainage layer transmissivity shall be greater than 5×10^{-4} m^2/s; 8) minimum slope specifications for drainage layer and collection pipes, pipes should meet recommendations (not minimums) of OAR 340-52-030 for sewer pipelines and drainage layer should slope at least 2% (after settlement); 9) manhole/cleanout location and spacing will not exceed capabilities of available equipment.

The deliverable for this subtask is an engineering design report that includes: 1) executive summary, conclusions, recommendations; 2) design basis, main assumptions, design criteria, and site constraints; 3) descriptions of key landfill components and their design functions; 4) a written explanation of the detailed design drawings and specifications; 5) a demonstration that landfill components will function as designed; 6) results of design-related materials testing; 7) preliminary specifications for construction materials; and 8) engineering analyses and calculations used to develop the design. This design report will be included in the Permit Application Document.

Subtask 0805 – Stormwater Management

The work under this subtask will include all of the activities necessary to design the stormwater management system. The appropriate precipitation data will be used and it will be in accordance with ODEQ Solid Waste Guidance Document Section 7.11. Our design work for the stormwater management system will be accordance with the following design criteria: 1) prevent run-on flow onto active or inactive portions of the landfill (assuming peak discharge from the 25-year storm); 2) collect and control run-off from active and inactive portions of the landfill (assuming a 24-hour, 25-year storm); 3) comply with the provisions of the storm water discharge (NPDES) permit and the Clean Water Act; 4) control sediment transport and remove suspended solids as necessary to comply with the NPDES permit conditions; 5) collect and contain leachate contaminated stormwater that accumulates in active fill areas; 6) temporarily store excess run-off from peak flows until it can be discharged at a lower, controlled rate; 7) minimize site erosion; 8) protect the integrity and effectiveness of the landfill cover system: and 9) minimize post-closure maintenance requirements. There are also other stormwater management documents available for Deschutes County and one is the Central Oregon Stormwater Management Manual (COSMM). This manual would also be consulted for additional design requirements that might be more stringent than the ODEQ requirements, such as the rainfall storm event. For example, the COSMM may require a rainfall storm event such as the 100-year 24 hour storm. We would use that rainfall event to design the stormwater management system so that the site would be in compliance with both requirements.

The deliverable for this subtask is an engineering design report that includes: 1) executive summary, conclusions, recommendations; 2) design basis, main assumptions, design criteria, and site constraints; 3) descriptions of key landfill components and their design functions; 4) a written explanation of the detailed design drawings and specifications; 5) a

demonstration that landfill components will function as designed; 6) results of design-related materials testing; 7) preliminary specifications for construction materials; and 8) engineering analyses and calculations used to develop the design. This design report will be included in the Permit Application Document.

Subtask 0806 – Final Cover System Design
The work under this subtask includes all of the engineering design work associated with designing the final cover system and the landfill gas management system. CEC understands that the final cover system should minimize water infiltration and erosion. Other important design issues include landfill gas containment and control, settlement, erosion, long-term maintenance requirements, and slope stability. Landfills that undergo remedial action to alleviate groundwater contamination may be required to meet more stringent design criteria for the final cover. CEC also understands that the landfill gas management system should be designed to accommodate a wide range of operational and environmental variables, withstand harsh physical/ environmental conditions, and function as long as needed. Our design work for the final cover system will be accordance with the following design criteria: 1) minimum slopes of 2% and maximum slopes of 30%; 2) accommodate anticipated settlements; 3) contain landfill gas and enhance gas collection and recovery efforts; 3) minimize erosion; 4) minimize surface water infiltration; 5) promote efficient surface water drainage and runoff; 6) maintain stability on side slopes; and 7) enhance site aesthetics. Our design work for the landfill gas management system will be accordance with the following design criteria: 1) handle the maximum gas flow rate predicted for the landfill; 2) accommodate variability in gas generation, composition, and other operational parameters; and 3) expand as needed to collect gas from future cells.

The deliverable for this subtask is an engineering design report that includes: 1) executive summary, conclusions, recommendations; 2) design basis, main assumptions, design criteria, and site constraints; 3) descriptions of key landfill components and their design functions; 4) a written explanation of the detailed design drawings and specifications; 5) a demonstration that landfill components will function as designed; 6) results of design-related materials testing; 7) preliminary specifications for construction materials; and 8) engineering analyses and calculations used to develop the design. This design report will be included in the Permit Application Document.

Subtask 0807 – Site Operation Plan
The work associated with this subtask will be for the completion of the site operation plan. The site operation plan is a plan that describes the Moon Pit Landfill's operation and maintenance and incorporates the Landfill's planned development and specific design elements. The site operation plan will incorporate pertinent information from such sources as final design documents, post-construction documents, hands-on operating experience and equipment manufacturers. CEC would like to request a copy of the site operation plan from the Knott Landfill so that it can be used as the backbone of the plan for Moon Pit Landfill. CEC would use that document as a "go-by" for creating the site operation plan for Moon Pit Landfill.

The deliverable for this subtask would be the completed Site Operation Plan reviewed by DCDOSW and included in the Permit Application Document.

Subtask 0808 – QA/QC Plan
The work associated with this subtask will be for the completion of the Construction Quality Assurance and Quality Control (QA/QC) plan. The QA/QC Plan is used during the construction of the landfill liner system and final cover system. It describes the field and laboratory testing required during the construction of the landfill liner system and final cover system. It is referenced in the final construction document report that is submitted to the ODEQ for review and approval of a particular construction project. CEC would like to request a copy of the QA/QC Plan from the Knott Landfill so that it can be used as the backbone of the plan for Moon Pit Landfill. CEC would use that document as a "go-by" for creating the QA/QC Plan for Moon Pit Landfill.

The deliverable for this subtask would be the completed QA/QC Plan reviewed by DCDOSW and included in the Permit Application Document.

Subtask 0809 – Environmental Monitoring Plan
Environmental monitoring is required to evaluate the performance of engineered environmental control systems (liners, leachate and gas control systems) and to assess potential environmental impacts and public health and safety risks from any contaminant releases. The work associated with this subtask will be for the completion of the environmental monitoring plan. CEC will prepare an environmental monitoring plan that will describe the elements that will be addressed in the environmental monitoring plan, including: 1) environmental monitoring network design; 2) groundwater; 3) surface water; 4) leachate; 5) vadose zone; 6) landfill gas; 7) air quality; 8) groundwater monitoring network construction; 9) sampling and analysis; 10) data analysis and evaluation; 11) setting permit specific concentration limits; 12) reporting; and 13) action requirements, assessment and corrective action. CEC will start with Knott Landfill environmental monitoring plan, which would be provided by DCDOSW, and update it to match Moon Pit Landfill.

The deliverable for this subtask will be a completed Environmental Monitoring Plan reviewed by DCDOSW and included in the Permit Application Document.

Subtask 0810 – Closure and Post-Closure Plan
Minimum requirements for closure plans and post-closure plans for MSW landfills are specified in the ODEQ's Financial Assurance Rule, OAR 340-94-100 through 145. The closure and post-closure requirements for Subtitle D landfills differ from those of non-Subtitle D MSW landfills. CEC understands that there are two separate categories of closure and post-closure plans, which are Subtitle D ("worst case") Closure and Post-Closure Plans and the Final Engineered Site Closure and Post-Closure Plans. CEC will complete the following as part of the work associated with this subtask: 1) prepare a "Worst-case"

(Subtitle D) Closure Plan and a “Worst-case" (Subtitle D) Post-closure Plan for determining appropriate costs for financial assurance planning; and 2) prepare a Final Engineered Closure Plan and a Final Engineered Post-closure Plan. Also as part of this subtask we will create the “Worst-Case” closure and post-closure cost estimate for the financial assurance plan.

The deliverable for this subtask would be a completed Closure and Post-Closure Plan reviewed by DCDOSW and included in the Permit Application Document.

Subtask 0811 – Other ODEQ Permits
The work associated with this subtask will include all activities necessary to obtain other required ODEQ permits such as the air quality permit and a stormwater permit. CEC will work with DCDOSW as well as the ODEQ to obtain the required air quality permit. We will calculate the emissions from various proposed on-site activities and complete all of the necessary forms and prepare a permit application document for review by DCDOSW. Once it has been reviewed by DCDOSW then corrections will be made and the final permit application document will be submitted to the ODEQ. CEC will also complete the necessary forms and drawings for a stormwater permit for the Moon Pit Landfill. We anticipate that most stormwater will be either evaporated or infiltrated based on the allowable disposal method through the Central Oregon Stormwater Management Manual. If the stormwater is evaporated or infiltrated, then it is possible that a stormwater permit might not be required. However, for the purposes of this proposal we are assuming one is required.

The deliverable for this subtask would be the completed permit application for the air quality permit and a completed permit application for the stormwater permit. These permit applications may be submitted outside of the solid waste permit and would require separate permit application documents.

We estimate that it will take approximately 12 months to complete the ODEQ permit, which will start when the Land Use Compatibility Statement has been issued. The cost estimate for Task 0800 is $765,750.

TASK 0900 – Public Outreach and Meetings
Effective stakeholder engagement is a cornerstone of successful environmental project management, particularly in complex solid waste landfill permitting and design. The approach taken by CEC, as outlined, emphasizes the importance of a multi-faceted communication strategy that involves a diverse group of stakeholders, including elected officials, regulatory agencies, environmental groups, and the community at large. The experience gained from the Benton County Talks Trash initiative serves as a valuable precedent, demonstrating the efficacy of regular meetings and the formation of focused subcommittees to address specific issues such as leachate management and odor control. Moving forward, it is crucial to maintain this level of collaboration, ensuring that all parties are aligned and informed about the project's scope, potential impacts, and environmental considerations like the protection of the Sage Grouse habitat. Public engagement challenges can be mitigated by a unified team that prioritizes community needs and environmental stewardship, striving for a balance between development and conservation.

This project will be highly visible within the community, and we will collaborate with the team to make sure that the stakeholders are well informed of the permitting process and effort that is being completed by the County. To connect with stakeholders, convey our work and ideas, and solicit input, we anticipate working with the Deschutes County Community Development Department in its mission to facilitate residents working together and improving and maintaining the quality of life. Our team will work in collaboration with the stakeholders to prepare the graphics and visuals necessary for each of the public events. We will be available to discuss the permitting issues and present the potential solutions during these events and be available to respond to comments and questions. What we would propose for this project is a regular quarterly meeting in which stakeholders can attend, either in person or virtually, to discuss the project. However, we do understand that at certain points in the project, it might be beneficial to meet monthly in order to engage the stakeholders for more serious discussions about the Moon Pit Landfill permitting process. We would further propose that if there are issues within the permitting process that subcommittees be formed to meet more frequently to discuss the issues and find common ground on a viable solution. We further propose that a dedicated website be created for this project such that stakeholders can access information, respond to comments, review meeting dates and times and be generally informed of the status of the project. The Project Team can upload documents to the website that could be reviewed and downloaded by stakeholders. The website can be created and monitored by CEC with input by Deschutes County. We believe this robust process will strengthen the County as a champion of the project and ensure it is well received by the public.

This task will run concurrently with all other tasks and deliverables would include meeting minutes, presentation documents such as posterboards or electronic media and other items as necessary. The estimated cost for this task is $604,100.

4.0 Project Assumptions

Below is the list of assumptions that CEC and our subconsultants used to determine the estimated project cost estimate. Our project cost estimate is $3,741,925.00. Since this project has an estimated timeline of 6 years, our overall assumption is that CEC and our subconsultants will increase our hourly rates, effective July 1 of every year by 3.5%.

Task 0100 – Planning

- The entire project team will meet in person at the first scoping meeting, then the second and third scoping meetings will only include CEC personnel virtually. We have included travel costs for the scoping meetings.

Task 0200 – Phase I Site Characterization Study

- CEC has assumed that CEC personnel will visit the site two times during the work for this task.
- Wallace has assumed that they will visit the site at least two times during the work for this task.

Task 0300 – Phase II Site Characterization Plan

- We have assumed that there will be one meeting with the ODEQ in Bend to discuss the project.
- We have assumed a conservative Phase II Site Characterization workplan. However, if the ODEQ requires more drilling and/or testing than specified then we will adjust the proposed cost and submit a change order to DCDOSW.
- We assume that Wallace Group will contract with the driller and the test pit operator and water will be available from the on-site well.
- Access to the three (3) existing on-site wells and the proposed boring and test pit locations will be provided by Deschutes County or the current operator and will be accessible by track-mounted drilling equipment.
- CEC personnel will visit the site two times during the fieldwork portion of the Phase II Site Characterization.

Task 0400 – Geotechnical Investigation

- We have assumed our field investigation work will be approved by the ODEQ. However, if the ODEQ requires more borings or test pits or additional laboratory testing than specified, then we will adjust the proposed cost and submit a change order to the DCDOSW.
- CEC personnel will visit the site 4 times during the course of the fieldwork associated with this task and we have included those travel costs in our proposal.
- The drillers and test pit excavation company will be contracted directly by Wallace.
- We assume water will be available from the on-site well.
- Access to the three (3) existing on-site wells and the proposed boring and test pit locations will be provided by Deschutes County or the current operator and will be accessible by track-mounted drilling equipment.

Task 0500 - Formal Archaeological Study

- One SHPO permit application will be prepared.
- One landowner is assumed.
- Approximately 250 undisturbed acres are within the project area that have not previously been investigated and will therefore need to be studied.
- AINW will conduct a full walkover of the undisturbed terrain to inspect the surface for archaeological resources.
- A reconnaissance-level inspection will be conducted for portions of the active quarries that have not been previously surveyed.
- Up to three QTU excavations are assumed. If additional excavations are needed or additional resources need to be evaluated, the added effort would require a contract modification.
- The excavations will not be on federal land. For scoping purposes, the excavations are assumed to be 0.6 meter (2 feet) deep.
- Up to 200 artifacts will be collected and curated under the terms of the SHPO permit.
- Up to 150 shovel tests will be excavated in areas with a high probability of an archaeological discovery.
- Shovel tests will be 30 centimeters (12 inches) at the surface and will be excavated to 50 centimeters (20 inches) below the surface or deeper, if warranted. Soils will be screened through ¼- and ⅛-inch mesh hardware cloth. The shovel tests will be backfilled immediately upon completion.
- Up to 10 archaeological resources are assumed to be within the project area. Five are already known to be within the project area, and AINW assumes an additional five may be discovered during the archaeological survey. Shovel tests will be excavated to identify the boundaries of archaeological sites. These are included in the total of 150 shovel tests assumed above.
- The SHPO permit discussed in the previous task will be needed for shovel tests near known archaeological sites as well as for all shovel tests on public land, if the land has passed into public ownership.
- Up to 100 artifacts would be collected and curated at the Oregon Museum of Natural and Cultural History under the terms of the SHPO permit.
- Fifteen Tribes/Tribal Nations will be consulted.
- Ten one-hour meetings with Tribes/Tribal Nations will be conducted remotely.
- Five draft letters will be provided to support nation-to-nation consultation with Tribes/Tribal Nations.
- Artifact photos will be provided to Tribes under the conditions of the SHPO permit.
- A single ARPA permit will be required for the entrance road.
- Up to 10 SHPO site forms will be needed for resources identified during the survey.
- CEC personnel will visit the site two times during the fieldwork associated with this task and we have included travel costs in our proposed cost estimate.

Task 0600 – BLM Permitting

- CEC assumes up to two in-person meetings with the BLM by the NEPA lead and up to 12 one-hour coordination calls via Teams with the County or BLM/Resource Agencies.
- CEC assumes BLM will prepare the Draft EA NOA and post all public notices. Public notices in local newspapers can be provided as an additional service.

- For the schedule, CEC has assumed a 30-day public comment period on the Draft EA/FONSI.
- For planning purposes, it is assumed that a FONSI is appropriate as the final decision document to support the Final EA.
- CEC will provide a Microsoft Word and pdf version of the EA and FONSI to BLM. It is estimated that no more than 300 pages will be required for the EA, including appendices.
- CEC assumes the context of the Draft EA will result in no more than 50 comments from the public and consulting agencies, which require addressing and incorporating into the Final EA.

Task 0700 Land Use Entitlements and Permitting

- Our scope and cost estimate does not include any time associated with appeals of Land Use Permit application either by the local citizens or Deschutes County. This includes appeals to the Land Use Board of Appeals, Oregon State Court or US Federal Court.
- Our scope and cost estimate does not include any time associated with responding to comments from Deschutes County Planning and Development or from local citizens. If comments are presented to the Team, then we will prepare a scope of work and cost estimate for responding to the comments and send that to DCDOSW for review and approval.

Task 0800 – ODEQ Permitting

- We have assumed that we will complete the design calculations and the permit document for submittal to the ODEQ.
- We have assumed that all permitting fees will be paid by DCDOSW.
- We did not include any costs associated with responding to comments. If we receive comments from the ODEQ or other agencies, we will prepare a cost estimate and scope of work and submit that to DCDOSW for review and approval before commencement of the work.
- Our cost estimate does not include attending any public hearings related to the ODEQ solid waste permitting. If we are required to attend public hearings, then we can prepare a cost estimate and scope of work and submit that to DCDOSW for review and approval. Our scope and cost estimate does not include any work associated with completing construction drawings or technical specifications for the construction of the first cell or any other ancillary items.
- Our scope and cost estimate does not include any work associated with the detailed design of the scale house, scales, entrance or any other building that will be located on the Moon Pit site.

Task 0900 – Community Outreach

- We are assuming there will be a public meeting once per quarter for the duration of the project. As shown on the Gantt Chart in Appendix B, we have estimated the project to task 6 years. We have budgeted for one trip per quarter, four per year, twenty-four meetings of the course of the project.
- Of the twenty-four meetings, we are assuming that 12 will be in person and 12 will be virtual.
- At least three CEC personnel will attend every meeting and we have assumed up to 9 additional members of our team will attend up to 12 meetings over the course of the project.
- Travel costs for attending the 12 quarterly meetings in person have been included.

5.0 Standard Billing Rates

CEC Standard Rates

Category rate table #2398:
2024 California Schedule of Fees

Title	Rate
Vice-President	$329.00
Senior Principal	$289.00
Principal	$268.00
Senior Consultant	$250.00
Senior Project Manager	$225.00
Project Manager III	$196.00
Project Manager III - Engineer	$196.00
Project Manager II	$184.00
Project Manager	$173.00
Project Manager I	$173.00
Assistant Project Manager	$167.00
Assistant Project Manager	$167.00
Project Scientist	$139.00
Project Consultant	$139.00
Staff Consultant	$129.00
Staff Scientist	$129.00
Senior Designer	$120.00
Designer	$120.00
Senior Technician	$115.00
Survey Technician II	$112.00
Cad Operator	$105.00
Cadd Technician	$105.00
Field Technician	$96.00
GIS Analyst II	$96.00
Survey Technician I	$96.00
Office Manager	$87.00
Secretary	$85.00
Administrative	$85.00
Seasonal Intern	$85.00

Wallace Group Standard Rates

WALLACE GROUP
NORTHWEST GEOSYSTEM EXPERTS

2024 STANDARD RATE SCHEDULE

PROFESSIONAL STAFF RATES (hourly)

Field Professional (Engineer or Geologist)	$128.00
Staff Professional (EIT or GIT)	$149.00
Project Professional (PE or RG)	$173.00
Senior Professional (PE or RG)	$197.00
Project Manager	$205.00
Principal Professional	$220.00

TECHNICAL STAFF RATES (hourly)

Technician / Special Inspector	$ 90.00
Steel / Welding Inspector	$110.00
Senior Technician / Senior Special Inspector	$115.00
Field Services Manager	$149.00
Draftsperson/CADD	$128.00
Administrative Personnel	$ 86.00

AINW Standard Rates

Date: August 15, 2024

Task	Description	Fagan PI/PM/Senior Lithic Analyst	Hulse Senior Geo. Archaeologist	Sarjeant Lab Manager	Johnson Asist. PM/ Supervising Archaeolog.	Team Staff Archaeolog.	Cowan Graphics-GIS	Inman Research/ Proj. Assist./ Proj. Admin	Loiselle Lab Mgr/ Crew Leader
	Labor Rates	$243.00	$185.00	$185.00	$139.50	$96.00	$185.00	$110.00	$112.00

Blackmore Standard Rate is $150.00 for all work

Rabe Consulting Standard Rates

Key Personnel	Hourly Rate
Project Manager	$150/hour
Wildlife Biologist	$95/hour
Botanist	$95/hour
Wetland Scientist	$130/hour
GIS Support	$110/hour
Field Technicians	$85/hour

APPENDIX A – COST ESTIMATE

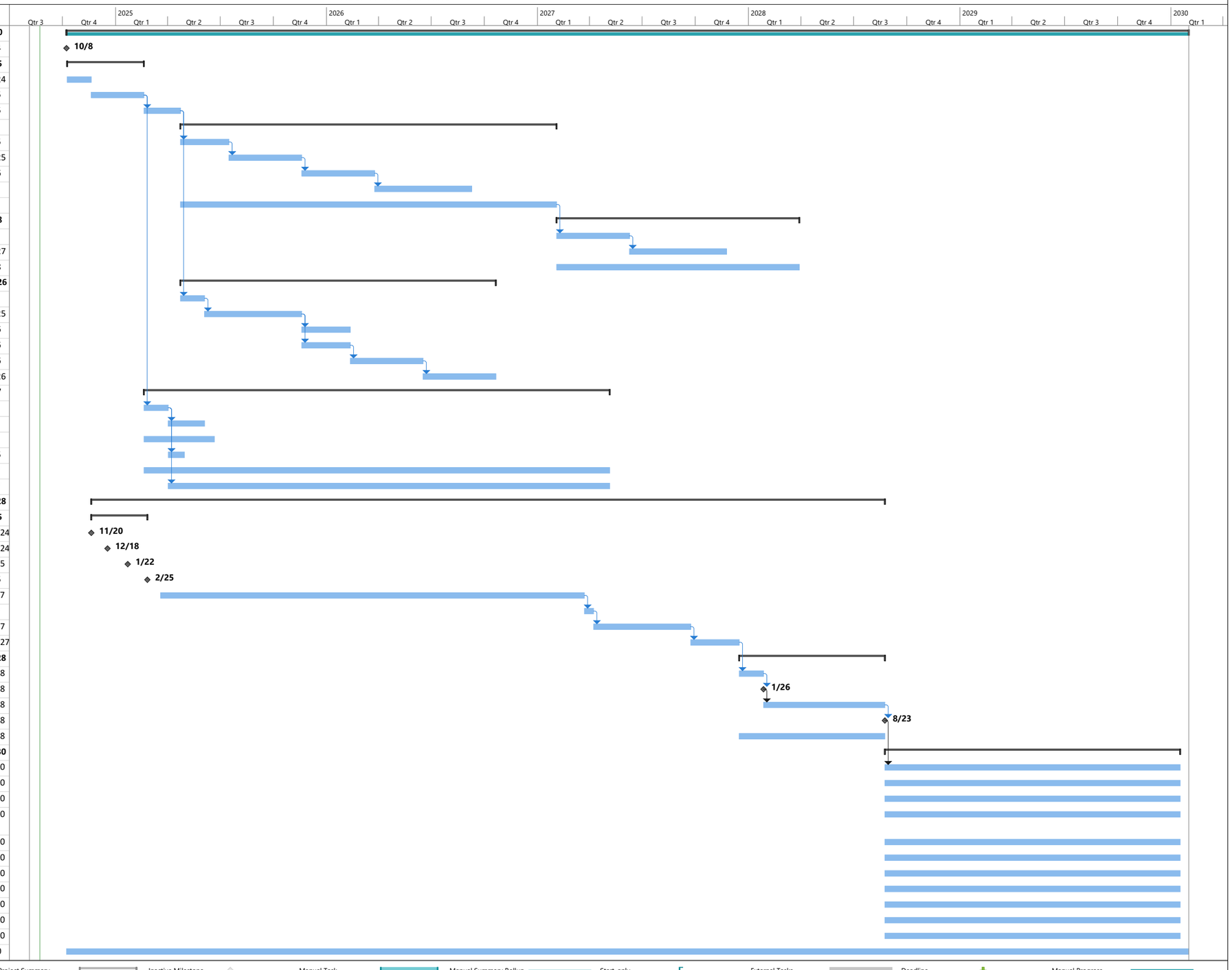
PROPOSAL FOR: *Deschutes County Department of Solid Waste*
SITE: *Moon Pit Landfill*
PROJECT NAME: *Phase 3 Permitting for the Moon Pit Landfill*
BY: *Jeff A. Shepherd*
CEC Proposal No.: *344-729*

	CEC	Wallace	Blackmore	Transight	Rabe	AINW	Total by Task
Task 0100 - Planning	$ 41,000.00	$ 1,300.00	$ 1,100.00	$ 1,100.00	$ 2,100.00	$ 2,100.00	**$ 48,700.00**
Task 0200 - Complete a Phase I Site Characterization Study	$ 36,500.00	$ 38,325.00	$ -	$ -	$ -	$ -	**$ 74,825.00**
Task 0300 - Complete a Phase II Site Characterization Study	$ 145,000.00	$ 694,200.00	$ -	$ -	$ -	$ -	**$ 839,200.00**
Task 0400 - Complete a Geotechnical Investigation	$ 150,000.00	$ 755,000.00	$ -	$ -	$ -	$ -	**$ 905,000.00**
Task 0500 - Complete a Formal Archaeological Study	$ 45,000.00	$ -	$ -	$ -	$ -	$ 233,000.00	**$ 278,000.00**
Task 0600 - Complete Permitting with BLM	$ 60,500.00	$ -	$ -	$ -	$ 38,850.00	$ -	**$ 99,350.00**
Task 0700 - Complete the Land Use Entitlements and Permitting	$ 81,500.00	$ -	$ 21,000.00	$ 24,500.00	$ -	$ -	**$ 127,000.00**
Task 0800 - ODEQ Solid Waste Permitting	$ 750,000.00	$ 15,750.00	$ -	$ -	$ -	$ -	**$ 765,750.00**
Task 0900 - Public Outreach and Meetings	$ 425,000.00	$ 36,750.00	$ 23,100.00	$ 26,250.00	$ 46,200.00	$ 46,800.00	**$ 604,100.00**
ORIGINAL ESTIMATED PROJECT TOTAL =	**$ 1,734,500.00**	**$ 1,541,325.00**	**$ 45,200.00**	**$ 51,850.00**	**$ 87,150.00**	**$ 281,900.00**	**$ 3,741,925.00**

APPENDIX B – GANTT CHART

DESCHUTES COUNTY DEPARTMENT OF SOLID WASTE
MOON PIT SITE PERMITTING

ID	Task Name	Duration	Start	Finish
1	**Phase 3 Permitting Moon Pit Site Landfill**	**1388 days**	**Tue 10/8/24**	**Thu 1/31/30**
2	Notice to Proceed	0 days	Tue 10/8/24	Tue 10/8/24
3	**Task 0100 - Planning**	**95 days**	**Wed 10/9/24**	**Tue 2/18/25**
4	Subtask 0101 - Review Existing Work and Site Conditions	30 days	Wed 10/9/24	Tue 11/19/24
5	Subtask 0102 - Scoping Meetings	65 days	Wed 11/20/2	Tue 2/18/25
6	**Task 0200 - Phase I Site Characterization Report**	45 days	Wed 2/19/25	Tue 4/22/25
7	**Task 0300 - Phase II Site Characterization Report**	**465 days**	**Wed 4/23/25**	**Tue 2/2/27**
8	Subtask 0301 - Surface Investigation	60 days	Wed 4/23/25	Tue 7/15/25
9	Subtask 0302 - Subsurface Investigation	90 days	Wed 7/16/25	Tue 11/18/25
10	Subtask 0303 - Hydrogeologic Testing	90 days	Wed 11/19/2	Tue 3/24/26
11	Subtask 0304 - Groundwater Quality Testing	120 days	Wed 3/25/26	Tue 9/8/26
12	Subtask 0305 - Phase II Site Characterization Report	465 days	Wed 4/23/25	Tue 2/2/27
13	**Task 0400 - Geotechnical Investigation**	**300 days**	**Wed 2/3/27**	**Tue 3/28/28**
14	Subtask 0401 - Phase I Geotechnical Investigation	90 days	Wed 2/3/27	Tue 6/8/27
15	Subtask 0402 - Phase II Geotechnical Investigation	120 days	Wed 6/9/27	Tue 11/23/27
16	Subtask 0403 - Geotechnical Report	300 days	Wed 2/3/27	Tue 3/28/28
17	**Task 0500 - Complete a Formal Archaeological Study**	**390 days**	**Wed 4/23/25**	**Tue 10/20/26**
18	Subtask 5001 - Coordination	30 days	Wed 4/23/25	Tue 6/3/25
19	Subtask 5002 - SHPO Permitting	120 days	Wed 6/4/25	Tue 11/18/25
20	Subtask 5003 - Archaeological Survey for Moon Pit Property	60 days	Wed 11/19/2	Tue 2/10/26
21	Subtask 5004 - Archaeological Survey for BLM Access Road	60 days	Wed 11/19/2	Tue 2/10/26
22	Subtask 5005 - Reporting	90 days	Wed 2/11/26	Tue 6/16/26
23	Subtask 5006 - Archaeological Investigation	90 days	Wed 6/17/26	Tue 10/20/26
24	**Task 0600 - Permitting with Bureau of Land Management**	**576 days**	**Wed 2/19/25**	**Wed 5/5/27**
25	Subtask 6001 - Environmental Surveys	30 days	Wed 2/19/25	Tue 4/1/25
26	Subtask 6002 - Greater Sage Grouse Mitigation Plan	45 days	Wed 4/2/25	Tue 6/3/25
27	Subtask 6003 - NEPA Support	88 days	Wed 2/19/25	Fri 6/20/25
28	Subtask 6004 - Wetland Memo (if needed)	20 days	Wed 4/2/25	Tue 4/29/25
29	Subtask 6005 - Environmental Permitting Support	576 days	Wed 2/19/25	Wed 5/5/27
30	Subtask 6006 - Agency Coordination/Environmental Assessm	546 days	Wed 4/2/25	Wed 5/5/27
31	**Task 0700 - Land Use Entitlements and Permitting**	**981 days**	**Wed 11/20/2**	**Wed 8/23/28**
32	**Subtask 0701 - Land Use Strategy Meetings**	**69 days**	**Wed 11/20/2**	**Tue 2/25/25**
33	Land Use Strategy Meeting One	0 days	Wed 11/20/2	Wed 11/20/24
34	Land Use Strategy Meeting Two	0 days	Wed 12/18/2	Wed 12/18/24
35	Land Use Strategy Meeting Three	0 days	Wed 1/22/25	Wed 1/22/25
36	Land Use Strategy Meeting Four	0 days	Tue 2/25/25	Tue 2/25/25
37	Regulatory Zone/Map Change by DC Planning & Developmer	523 days	Thu 3/20/25	Mon 3/22/27
38	Subtask 0702 - Field Review	12 days	Tue 3/23/27	Wed 4/7/27
39	Subtask 0703 - Data Collection and Compilation	120 days	Thu 4/8/27	Wed 9/22/27
40	Subtask 0704 - Prepare Required Submittal Materials	60 days	Thu 9/23/27	Wed 12/15/27
41	**Subtask 0705 - Submit Conditional Use Permit Application**	**180 days**	**Thu 12/16/2**	**Wed 8/23/28**
42	Administative Complete Review	30 days	Thu 12/16/27	Wed 1/26/28
43	Administrative Complete	0 days	Wed 1/26/28	Wed 1/26/28
44	Technical Review	150 days	Thu 1/27/28	Wed 8/23/28
45	Board of Commissioners Approval	0 days	Wed 8/23/28	Wed 8/23/28
46	Subtask 0706 - Project Hearings and Meeting Support	180 days	Thu 12/16/27	Wed 8/23/28
47	**Task 0800 - ODEQ Permitting**	**365 days**	**Thu 8/24/28**	**Wed 1/16/30**
48	Subtask 0801 – Location Restrictions	365 days	Thu 8/24/28	Wed 1/16/30
49	Subtask 0802 – Site Development and Layout	365 days	Thu 8/24/28	Wed 1/16/30
50	Subtask 0803 - Liner System Design	365 days	Thu 8/24/28	Wed 1/16/30
51	Subtask 0804 - Primary and Secondary Leachtae Collection System Design	365 days	Thu 8/24/28	Wed 1/16/30
52	Subtask 0805 - Stormater Management Design	365 days	Thu 8/24/28	Wed 1/16/30
53	Subtask 0806 - Final Cover System Design	365 days	Thu 8/24/28	Wed 1/16/30
54	Subtask 0807 - Site Operations Plan	365 days	Thu 8/24/28	Wed 1/16/30
55	Subtask 0808 - QA/QC Plan	365 days	Thu 8/24/28	Wed 1/16/30
56	Subtask 0809 - Environmental Monitoring Plan	365 days	Thu 8/24/28	Wed 1/16/30
57	Subtask 0810 - Closure and Post Closure Plan	365 days	Thu 8/24/28	Wed 1/16/30
58	Section 0811 - Other ODEQ Permits	365 days	Thu 8/24/28	Wed 1/16/30
59	**Task 0900 - Community Outreach**	1388 days	Tue 10/8/24	Thu 1/31/30



Project No.: 344-729
Date: Fri 8/23/24

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

APPENDIX C – PROJECT TEAM RESUMES

Jeff Shepherd, P.E.

Senior Principal and San Diego Operations Lead and Sacramento Operations Lead

35 YEARS OF EXPERIENCE

EDUCATION

B.S., Civil Engineering, University of Oklahoma, 1989

Mr. Shepherd is a Senior Principal for Civil & Environmental Consultants, Inc. and is the Operations Lead for the California Offices located in Sacramento and San Diego, CA. Mr. Shepherd has over 35 years of experience in the solid waste management industry. Over the course of his career, Mr. Shepherd has held technical and managerial positions with both solid waste management companies and environmental consultants. Working for large public companies, he has been the engineer for Waste Management overseeing several sites as well as an engineer for Browning Ferris Industries working out of the Corporate office. Mr. Shepherd has worked for a number of consultants working in the solid waste management industry. He also owned his own firm that specialized in engineering design for solid waste management facilities.

Mr. Shepherd possesses a strong history of serving solid waste and industrial clients. He has been instrumental in the design, permitting, and construction of multiple regional solid waste landfills and has made significant contributions to the development of long-term disposal capacity. Mr. Shepherd's diverse technical background incorporates leading effective cross functional project teams. As stated above, Mr. Shepherd's 35 years experience includes civil engineering specifically related to the design, construction, expansion, and closure of landfill systems. His experience with landfills includes landfill horizontal and vertical expansions, baseliner and final cover designs, stormwater management system design, leachate collection and recirculation systems and pump stations, landfill gas collection and control system design, landfill stability analyses, landfill financial rate packages, as well as construction inspection, quality assurance, and certification of these systems.

PROJECT EXPERIENCE

Solid Waste | Hauling Facilities

Facility Design for Meridian Transfer Station, Republic Services, Inc., Boise, Idaho

Role: Project Manager

Mr. Shepherd was the project manager for the design and construction of the new scale house and scales at the Meridian Transfer Station and Hauling Company Facility. Mr. Shepherd managed the internal team of engineers to design the location of the scales and scale as well as the pavement section. Mr. Shepherd was also responsible for submitting the permit application to the City of Meridian for review and approval.

Solid Waste | Transfer Stations

Negus Transfer Station and Recycling Facility, Deschutes County (OR) Department of Solid Waste, Redmond, OR*

Role: Project Manager

Currently the Project Manager for a new transfer station and recycling facility located in Redmond, OR. The new transfer station will be a 30,000 SF state of the art facility. Mr.

EXPERTISE

Construction Quality Assurance of liner and final cover systems

Design and bid packages of liner and final cover systems

REGISTRATIONS

Professional Engineer

- AR 10836
- WY 10065
- NM 16764
- OK 18259
- UT 7222101-2202
- KS 17820
- OR 92360PE
- HI 11827
- NV 022031
- WA 56733
- MT PEL-PE-LIC-60028
- ID 18240

Shepherd is managing an internal team of engineers performing design calculations related to the stormwater and leachate collection system. Also, as part of this project, Mr. Shepherd is managing a team of outside subconsultants that includes architects, structural engineers, landscape architects, electrical and mechanical engineers, planning and zoning engineers and traffic engineers. This new transfer station and recycling facility is being designed from the ground up and includes a scale house, scales, roads, water, wastewater, electrical, and mechanical.

Solid Waste | Landfill Permitting and Design

Coffin Butte Landfill Lateral Expansion, Republic Services, Corvallis, OR

Mr. Shepherd is the project manager for the Coffin Butte Landfill lateral expansion project. Mr. Shepherd is responsible for the completion of the Conditional Use Permit application, performing the Phase I and II site characterizations and the overall design of the lateral expansion area.

Phase 3B Cell Design and Bid Package, WCA Waste of Oklahoma, Pauls Valley, OK

Role: Project Manager

Mr. Shepherd was responsible for managing an internal team of engineers and CAD technicians to design Phase 3B at the Pauls Valley Landfill in Pauls Valley, OK. He was also responsible for completing construction drawings and a bid package that included technical specifications and submit the bid packages to contractors for bidding.

New Entrance Design, Chemical Waste Management, Arlington, OR

Role: Project Manager

Mr. Shepherd was the project manager for the design of a new entrance facility at the Chemical Waste Management Landfill located in Arlington, OR. This project consisted of the design of a concrete pad to hold vehicles so that they can be checked for radioactive waste by the radian detector meters. Mr. Shepherd managed a team of internal engineers that designed the concrete pad, performed stormwater calculations and site layout. Mr. Shepherd also managed the electrical engineering design that was performed by internal electrical engineers.

Final Cover System Design, City of Pauls Valley, Pauls Valley C&D Landfill

Role: Project Manager

Mr. Shepherd was the project manager for the design of the final cover system at the Pauls Valley C&D Landfill located in Pauls Valley, OK. As part of this project, Mr. Shepherd managed an internal team of engineers that performed stormwater calculations to determine the stormwater discharge from the site. The difficult part of this project, was determining the size of the detention basin and the discharge so that the downstream private lake was not contaminated by runoff from the landfill. Mr. Shepherd was also responsible for the preparation of the permit documents and submitting them to the ODEQ for review and approval. Furthermore, Mr. Shepherd was responsible for the preparation of the construction bid package, submitting them to contractors for bidding and managing the bidding process.

Cell 4C Cell Design and Bid Package, Chemical Waste Management, Arlington, OR

Role: Project Manager

Mr. Shepherd was the project manager for the Cell 4C cell design and bid package preparation at the Chemical Waste Management Landfill located in Arlington, OR. This project consisted of the design of Cell 4C based off of the permit drawings and the asbuilt drawings from Cell 4A and 4B. Mr. Shepherd also managed the preparation of the construction bid package and submitted the bid package to several local contractors for bidding purposes. Mr. Shepherd managed the prebid meeting and was responsible for reviewing the bids and making a recommendation to the Client.

Lateral Expansion Permitting and Design, WCA of Arkansas, Arkansas

Role: Project Manager

Project manager for an 120 acre landfill expansion project in southern Arkansas. Responsibilities included managing an internal project team and subcontractors. The project included preparation of a Major Permit Modification Application for the Arkansas Department of Environmental Quality. Work completed as part of the application included subsurface exploration, environmental assessments including wetlands and endangered species, analysis of existing hydro geological and geologic on-site information, and preparation of applicable design drawings. Other work included the detailed engineering design including operational grading, stormwater, leachate collection, and landfill gas collection system design, preparation of an operational plan, nuisance controls plan, and applicable ADEQ forms and a 60 sheet drawing set.

Jeff Shepherd, P.E.

Senior Principal and San Diego Operations Lead and Sacramento Operations Lead

Chemical Waste Management Facility, Chemical Waste Management, Arlington, OR*

Role: Senior Engineer/Project Manager

Mr. Shepherd has been the Senior Engineer/Project Manager for the Landfill L-14 Expansion. This includes managing an internal team of engineers performing design calculations on the liner and leachate collection system as well as detailed slope stability calculations. Was able to produce the engineering design package within 6 months for submittal to the regulating agency.

Module 16 Cell Design, Waste Management, Arlington, OR*

Role: Project Manager

Mr. Shepherd served as the project manager for preparing engineering design documents related to the cell construction project for the Columbia Ridge Landfill, in Arlington, OR. Mr. Shepherd prepared the cell design drawings as well as the construction bid package for Module 16. Mr. Shepherd managed the bid process by sending out the bids, responding to questions from contractor, receiving the bids and completing an analysis as to the lowest and best bid. Was also responsible during construction, to respond to requests for information, review and approve submittals and to manage the weekly construction meetings.

Lateral Expansion Permitting and Design, City of Enid, OK, Enid, OK*

Role: Project Manager

Mr. Shepherd is currently responsible for the engineering design of a lateral expansion at the existing City of Enid Landfill located in Enid, OK. Duties include coordinating between technical and non-technical personnel including lawyers and public relations personnel. The design includes all aspects of a solid waste landfill including liner design, final cover design, slope stability calculations, leachate collection system design, gas collection system design, volume calculations including airspace and soil and infrastructure design including scale house, scales and access roads. Other duties include coordinating between the ODEQ and the client in order to process and approve the lateral expansion permit application.

Cell 18 and Leachate Storage Pond Design, Central Disposal, Prague, OK

Role: Senior Engineer/Project Manager

Mr. Shepherd was responsible for managing a team of internal engineers and CAD technicians working on this design project. Design included the liner system and leachate collection system using the HELP Model. Slope stability calculations were completed to allow for leachate recirculation and to ensure the landfill remained stable. The design also included a leachate storage pond and the liner system associated with that. A permit modification was completed and submitted to the Oklahoma Department of Environmental Quality, which was reviewed and approved. Mr. Shepherd then managed the team to complete construction drawings and a construction bid package consisting of technical specifications. The construction bid packages were submitted to contractors for bidding purposes. Mr. Shepherd managed the bidding process by responding to questions from the contractors, sending out addendums and reviewing the submitted bids.

Solid Waste | CQA Engineering Landfills

Landfill Gas Construction Quality Assurance, Republic Services, Inc., Coffin Butte Landfill

Role: CQA Engineer

Mr. Shepherd was the CQA Engineer during the construction of landfill gas extraction wells and piping at the Coffin Butte Landfill located in Corvallis, OR. Mr. Shepherd managed the CQA Technician during construction to ensure that the work was being completed in accordance with the technical specifications. Mr. Shepherd managed the weekly construction meetings, reviewed the field data and completed the final CQA Report.

CQA for Phase 3B, WCA Waste of Oklahoma, Pauls Valley Landfill

Role: CQA Engineer

As the CQA Engineer, Mr. Shepherd was responsible for the construction of the liner system in Phase 3B at the Pauls Valley Landfill. Responsibilities included managing the CQA Technician, reviewing test documentation from the field, reviewing laboratory test results and reviewing documentation from the field to ensure that the liner system was built in accordance with the construction drawings and the technical specifications. Mr. Shepherd was also responsible for completing the Liner Installation and Testing Report for submittal to the ODEQ for their review and approval.

Construction Quality Assurance Services for Liner System Construction, Waste Management, Chemical Waste Management and WCA Waste, Arkansas, Oregon, Oklahoma

Role: CQA Engineer

Was responsible for project management, observation, testing and certification of the construction of liner systems at numerous landfills located in Arkansas, Oregon, and Oklahoma.

CQA Engineering for Alternative Earthen Final Cover, Chemical Waste Management, Arlington, OR
Role: CQA Engineer
Mr. Shepherd was the CQA Engineer during construction of the alternative earthen cover for Landfill L-13 at the Chemical Waste Management Facility. The alternative earthen cover was a 3.5-ft thick cover that was required to be placed in 1-ft lifts and compacted between 90 and 95 percent of the maximum dry density at 0 to plus 5 percent moisture content of the optimum moisture content. CQA Engineering required field density tests to be taken on a 100-ft by 100-ft grid with samples being sent to the laboratory for moisture content testing. Mr. Shepherd was able to achieve 100 percent passing on all density tests. Mr. Shepherd also completed the CQA Engineering Report for the alternative earthen cover and submitted the report to the regulating agency, which approved the report without any comments.

Landfill Gas Cutoff Trenches, City of Ada, OK, Ada, OK
Role: CQA Engineer
Mr. Shepherd was responsible for the CQA Engineering related to the construction of a 2,000 foot long gas cutoff trench constructed at the City of Ada Landfill. Mr. Shepherd's duties included the management of CQA field personnel and the contractor. Gas cutoff trench consisted of an approximate 20-foot deep trench backfilled with aggregate and soil. Also, a gas collection pipe was installed within the aggregate that was connected to a small blower system that extracted landfill gas from the trench. Mr. Shepherd also completed the construction report that was submitted to the Oklahoma Department of Environmental Quality for review and approval. Report was approved with no comments.
** Work performed prior to joining CEC*

Abandoned Mine Lands
Montreal GOB Pile, Arkansas Department of Environmental Quality, Montreal, AR
Role: Project Manager
Mr. Shepherd is currently the project manager on the Montreal GOB Pile Abandoned Mine Lands project. The project consists of placing a 3-foot thick soil cover over a pile of coal mining refuse to prevent stormwater run-off from entering local waterway. Project is financed by the Office of Surface Mining, therefore, a complete environmental review was required. Mr. Shepherd managed the team completing the NEPA/SEPA review and the Army Corps of Engineers Section 404 permitting. Once all environmental permitting was completed, Mr. Shepherd managed the team that put together the construction drawings and bid package including technical specifications. Project is currently in the review process by the Arkansas Department of Environmental Quality and should be going out to bid for construction in June 2021.

Brotherton Abandoned Mine Lands, Arkansas Department of Environmental Quality, Branch, AR
Role: Project Manager
Mr. Shepherd is the project manager for the Brotherton Abandoned Mine Lands project located in Branch, AR. This project consists of draining an abandoned coal pit and filling the pit with mine spoils to remove the hazardous vertical walls. Since this project is funded by the Office of Surface Mining, a complete environmental review is required. Mr. Shepherd was responsible for ensuring that all the NEPA/SEPA and Army Corps of Engineers Section 404 permitting was completed. The environmental review was completed and Mr. Shepherd was responsible for managing the team completing the detailed design work, the construction drawings and the construction bid package. The construction bid package has been submitted to the Arkansas Department of Environmental Quality for their review. Anticipated that this project will go out to bid in June 2021.

Van Meter Abandoned Mine Land, Arkansas Department of Environmental Quality, Branch, AR
Role: Project Manager
Mr. Shepherd was the project manager for the Van Meter Abandoned Mine Land project located in Branch, AR. Mr. Shepherd managed an internal team of engineers and scientists that completed this project. The project consisted of an ecological investigation of the site, contacting several agencies as part of the NEPA/SEPA process as well as obtaining a Categorical Exclusion from the US Army Corps of Engineers for the project. Engineering design consisted of cut/fill design to fill the existing mine pit as well as completing a hydrology and hydraulic design to ensure that the discharge from the mine pit does not flood the adjacent AR State Highway.

Jeff Shepherd, P.E.

Senior Principal and San Diego Operations Lead and Sacramento Operations Lead

Beaulah Highwall Reclamation, Arkansas Department of Environmental Quality, Hartford, AR

Role: Principal in Charge

Project included the reclamation of an abandoned mine land site, that includes a vertical opening, 970 feet of dangerous highwall, and 2.2 acres of spoil area. Project is financed by the Office of Surface Mining, therefore, a complete environmental review was required. Mr. Shepherd managed the team completing the NEPA/SEPA review and the Army Corps of Engineers Section 404 permitting. Once all environmental permitting was completed, Mr. Shepherd managed the team that put together the construction drawings and bid package including technical specifications.

Clark Abandoned Mine Site Reclamation, Arkansas Department of Environmental Quality, Greenwood, AR

Role: Principal in Charge

Project includes the reclamation of an abandoned mine land site, that includes a hazardous water body, with dangerous highwalls and spoil piles. Project is financed by the Office of Surface Mining, therefore, a complete environmental review was required. Mr. Shepherd managed the team completing the NEPA/SEPA review and the Army Corps of Engineers Section 404 permitting. Once all environmental permitting was completed, Mr. Shepherd managed the team that put together the construction drawings and bid package including technical specifications.

PROFESSIONAL AFFILIATIONS

National Waste & Recycling Association

American Society of Civil Engineers

Solid Waste Association of North America

Lindsey M. Angell, P.E.
Principal

12 YEARS OF EXPERIENCE

EDUCATION

M.S., Geotechnical Engineering, California State University Sacramento, 2014

B.S., Civil Engineering, California Polytechnic University, San Luis Obispo, 2010

Mrs. Angell is Principal Solid Waste Engineer for CEC in the Gold River (Sacramento), California office. She is a professional engineer and has over 10 years in experience in a variety of engineering, mining and environmental projects for the private and public sector in California, Washington, Nevada and Oregon. She specializes in managing multi-year contracts with municipalities across California providing a variety of design and support services including permitting, engineering design and regulatory compliance. Her project experience includes geotechnical site investigations and assessments, solid waste permitting and environmental compliance, design and analysis of waste management units, construction management services, shallow and deep foundations, soil improvements, slope stability and earth retention systems. She is currently serving on the Board of Directors for The California Geotechnical Association (CalGeo) as a Director at Large.

PROJECT EXPERIENCE

Mining

California Asbestos Monofil, WM, Copperopolis, California*

Role: Project Manager/Technical Lead

Designed a 36-foot high, 1,000-foot long mechanically stabilized earth (MSE) wall, site regrading and access road alignment to stabilize an existing mill tailings stockpile. Performed static, pseudo-static stability of MSE wall as well as internal calculations of the welded wire mesh reinforcements. Performed inspections of wall during construction and performed annual maintenance inspection for the facility. Oversaw preparation of Report of Waste Discharge and technical analyses associated with the mine pit and tailings stockpile closure projects.

McLaughlin Mine, Homestake Mining Company, Lower Lake, California*

Role: Project Manager/Project Director

Oversaw semi-annual monitoring WDR monitoring program for the closed mine site. Oversaw preparation of annual financial assurance cost estimates for the RWQCB and SMARA. Assisted with the construction certification reports for the tailings impoundment closure. Performed technical analyses and sampling in support of the closure construction of the tailings impoundment.

Confidential, SGI, California*

Role: Technical Lead

Assisted in the preparation of the CEQA documents in support of a mine expansion project in California. Oversaw development of the geotechnical impact study, cultural resources and overall CEQA application.

EXPERTISE

Vertical and Horizontal Landfill Expansions

Geotechnical Investigations

Slope Stability Analyses

Public Work Contracts

Landfill Permitting

Landfill Design

REGISTRATIONS

Professional Engineer
- CA C83364
- NV 24852
- AZ 81551
- OR 105510PE

CERTIFICATIONS

40-Hour OSHA HAZWOPER, Occupational Safety & Health Administration

MSHA Part 48 Aboveground & Underground Mine Safety Training, Mine Safety and Health Administration

First Aid, American Red Cross

CPR and AED, American Health & Safety Institute

Pit Expansion, Butte Sand & Gravel, Butte, California*
Role: Technical Lead
Performed geotechnical site investigation and analysis in support of a mine expansion at an aggregate mine. Prepared permitting documents to revise permit application for the expansion.

Waste Management
Apex Regional Landfill, Republic Services, Las Vegas, Nevada*
Role: Technical Lead
Prepared the site operating permit and composting facility operating permit applications. Received new permit after 10 year long permitting effort with the Southern Nevada Environmental Health District. Prepared technical drawings in support of stormwater bypass channel and Module 10. Performed site investigation and rockfall analysis of native and cut slopes with CRSP software. Provided remediation recommendations for rockfall fence and ditch.

Fink Road Expansion, Stanislaus County, Crows Landing, California*
Role: Project Manager/Project Director
Performed geotechnical investigation and engineering analyses in support of a 100-foot vertical expansion at the Fink Road Landfill. Expansion included a separation liner system between a class II and unlined unit and the Class III waste unit. Analyses included both static and pseudo-static slope stability analysis, settlement and leachate collection and removal system pipe structural calculations. Managed permitting efforts to revise JTD to obtain new SWFP from CalRecycle and WDRs from the RWQCB

Hillsboro Landfill, MW, Hillsboro, Oregon*
Role: Technical Lead
Performed static and pseudo-static stability analysis for permit renewal for a solid waste disposal facility. Assisted in the preparation of the geotechnical analysis report. Site included wetlands, liquefiable soil and areas of liquefaction soil remediation.

Burbank Landfills 1, 2 and 3, City of Burbank, Burbank California*
Role: Project Director/Engineer of Record/Project Manager
Project Director/Manager of multi-year on-call service agreement since 2017. Project consists of oversight of site landfill gas operation and maintenance, design of new waste management units and LFG expansions, oversight of compliance monitoring for LFG system including reporting and interfacing with the South Coast Air Quality Management District, Los Angeles County of Environmental Health and the Regional Water Quality Control Board, updating site Joint Technical Document (JTD), management of closed landfill units, and coordinating the permitting effort and sitting for a new compost facility. Engineer of Record for the Cell 2D/E Design.

Former Cal Compact Landfill, RE Solutions | Carson Reclamation District, Carson, California*
Role: Project Director/Project Manager
Project Director/Manger of multi-year on-call service agreement for the on-site operation and maintenance of the environmental systems at the former landfill from 2021-2023. Project consists of full-time oversite of the landfill gas collection and control system and groundwater treatment system operation, maintenance and compliance monitoring. Includes reporting to the South Coast Air Quality Management District, Department of Toxic Substances Control and the Regional Water Quality Control Board.

Z-Best Composting Facility, GreenWaste, Gilroy, California*
Role: Technical Lead/Project Director
Prepared Composting Facility Technical Report to meet the requirements of the General Waste Discharge Requirements for Composting Operations WQ 2015-0121-DWQ. Provided technical oversight for the compost facility expansion design including oversight of civil, structural and electrical design. Coordinated permitting effort with the RWQCB and County. Prepared geotechnical report in support of facility modifications.

Central Landfill, Yolo County, Woodland, California*
Role: Project Manager
Project manager of multi-year design, construction quality assurance (CQA), and on-call service agreement. Project consists of design and CQA of two 20-acre waste management unit and CQA of a closure system for two units. Additional effort under on-call services including geotechnical investigations for building permits, groundwater separation support, engineering feasibility studies,

liquid management unit process review and design, and stormwater compliance review and National Pollutant Discharge Elimination System (NPDES) permit. Providing permitting support to the County to the RWQCB and LEA.

Guadalupe Soil Management Unit, Chevron, Guadalupe, California*
Role: Technical Lead
Provide permitting and design support for the proposed soil management area at the Chevron Guadalupe Restoration Area in Guadalupe, CA. Assisted in the creation of the project description and civil design for the CEQA process and prepared Report of Waste Discharge for the soil management area.

Kirby Canyon Landfill, WM, Morgan Hill, California*
Role: Technical Lead
Assisted with the preparation of a Master Plan for the facility. Performed slope stability and drainage analyses for the proposed final grading plan of the facility. Assisted in the revision of the site joint technical document, preliminary closure and post closure maintenance plan and associated cost estimates. Oversaw preparation of engineering analyses in support of the Cell 6 Base Liner Design.

Recology Hay Road, Recology, Dixon, California*
Role: Project Manager/Technical Lead
Oversaw preparation of the updated JTD and associated closure/post-closure maintenance plan and financial assurance for a solid waste disposal facility. Prepared water balance model for composting facility. Prepared Construction Quality Assurance Plans, Certification Reports, Construction Drawings and Technical Specifications for several disposal modules and clean closure of a waste pile and land treatment unit. Managed and prepared the design of an 8-acre composite base liner system waste disposal unit. Managed geotechnical investigation and engineering analyses in support of borrow area and landfill expansion project. Technical lead for geotechnical analyses in support of lateral expansion of the facility including slope stability, settlement, LCRS design, remaining life and closure and post-closure cost estimates.

Potrero Hills Landfill, Waste Connections, Suisun, California*
Role: Technical Lead
Performed hydrology calculations to size stormwater drainage features. Performed site water balance to size pumping stations and pipe network. Managed 6-acre cell design and provided permitting support with the RWQCB. Performed stability analysis to check stockpile and excavation grades.
** Work performed prior to joining CEC*

AWARDS

Cal Geo Volunteer of the Year Award 2017-2018

PROFESSIONAL AFFILIATIONS

California Geotechnical Association (CalGeo)

Solid Waste Association of North America

Woman in Solid Waste & Recycling (WISR)

PRESENTATIONS

Lindsey Angell. "The Importance of Landfill Planning" SWANA Western Regional Symposium, Fish Camp, California, April 2022

Lindsey Angell. "2018 Camp Fire & Challenges Face by the Local Landfill", National Science Foundation - Sustainable Materials Management Extreme Events Reconnaissance Group, San Luis Obispo, California, September 2022.

Lindsey Angell. "4D Career Building - Elevating Yourself, Your Company, the Industry and Others" ASCE-GE GeoCongress, Los Angeles, California, March 2023

Lindsey Angell. "Future Forward - Should you Designing Facilities for More than the Regulatory Minimum", SWANA Western Regional Symposium, Monterey, California, April 2023

Lindsey Angell, Cortney Zellman-Grubbs. "Successful Management of a Closed Landfill Cover", SWANA Western Regional Symposium, Monterey, California, April 2023

Eric P. Scuoteguazza

Principal and Corporate Cultural Resources Practice Lead

30 YEARS OF EXPERIENCE

EDUCATION

MBA, Business Administration, Point Park University, 2013

M.A., Anthropology, Ball State University, 2002

B.A., Anthropology/Earth Science, Gannon University, 1994

CERTIFICATIONS

Registered Professional Archaeologist, Register of Professional Archaeologists

Fundamentals of Professional Practice, ASFE, The Geoprofessional Business Association

Mr. Scuoteguazza is a registered professional archaeologist and recognized group manager with 30 years' experience conducting Phase I, II, and III cultural resources investigations throughout the United States. He has forged close working relationships with state historic agencies and gained valuable knowledge of the internal operating procedures of state and federal regulatory agencies.

He is an expert-level practitioner of compliance procedures under various federal implementation codes.

Exceeding the professional requirements of the United States Secretary of Interior Standards (36 CFR 61), he specializes in the Section 106 compliance process and has served as a Qualified Professional Archaeologist for PennDOT, where he was the regulatory authority for Section 106 requirements on behalf of the PennDOT, as delegated by the Federal Highway Administration. In this capacity, Mr. Scuoteguazza acquired extensive training and experience in the federal historical compliance process and Native American consultation.

Duties include managing a portfolio of hundreds of cultural resources projects, directing archaeological identification, assessments and data recovery investigations, determining National Register eligibility of historic properties, reviewing and preparing consultant scopes, preparing agreement documents, managing open-end contracts, Tribal Consultation, and public outreach and training on Section 106 compliance and Tribal Consultation.

PROJECT EXPERIENCE

Oil & Gas

FERC 7(c) Phase I and Multiple Phase II for Natural Gas Pipeline Project, Confidential Natural Gas Client, Missouri and Illinois*
Role: Group Manager/Principal Investigator
FERC 7(c) Phase I and Multiple Phase II, 100-mile confidential natural gas pipeline project in Missouri and Illinois.

FERC 7(c) Filing for Natural Gas Pipeline, Delta LNG/Delta Express (Venture Global), Plaquemines Parish, Louisiana*
Role: Cultural Lead and Tribal Liaison
FERC 7(c) filing on a 526-acre LNG terminal and 290-mile natural gas pipeline.

600-Mile Confidential Pipeline Project, Dominion*
Role: Regulatory Advisor

Eric P. Scuoteguazza

Principal and Corporate Cultural Resources Practice Lead

Cultural and environmental agency topics for a 600-mile confidential pipeline in multiple counties in West Virginia and Virginia.

FERC 7(c) Filing for Natural Gas Pipeline, AECOM/NiSource, Southwestern Western Pennsylvania*
Role: Project Manager
FERC 7(c) Line 23 Pipeline in within Southwestern Western Pennsylvania. Phase I Cultural Resources Investigation of an 8.6-mile long gas pipeline.

Delta LNG/Delta Express, Plaquemines Parish, LA*
Role: Cultural Lead and Tribal Liaison
FERC 7(c) filing on a 526-acre LNG terminal and 290-mile natural gas pipeline in Plaquemines Parish, Louisiana. Duties included serving as sole liaison for engagement and consultation with 30 tribal organizations, including the Osage Nation.

Spire Pipeline, Missouri and Illinois*
Role: Group Manager/Principal Investigator
FERC 7(c) Phase I, Multiple Phase II on behalf of FERC and the USACE, 100-mile natural gas pipeline project in Missouri and Illinois. Duties included serving as sole liaison for engagement and consultation with 30 tribal organizations, including the Osage Nation.

TL-400 Pipeline Replacement Project, Pickaway County, Ohio*
Role: Principal Investigator
Cultural Resources Investigation for a natural gas pipeline.

Lucas-Weaver-Ripley Abandonment Project, Ashland County, Ohio*
Role: Principal Investigator
Cultural Resources Investigation for a natural gas well abandonment project.

Franklin 20-inch Storage Pipeline Project, Wayne and Summit Counties, Ohio*
Role: Lead Archaeologist/Principal Investigator
Cultural Resources Investigation for a natural gas pipeline and storage project.

Hunt, Laurel, and Benton Well Abandonment Project, Hocking and Vinton Counties, Ohio
Role: Project Manager
Cultural Resources Investigation for a natural gas well abandonment project.

Power

Phase I Archaeological Investigation, South Chestnut Wind Farm Project, Iberdrola Renewables, Fayette County, Pennsylvania*
Served as Principal Investigator for the Phase I Archaeological Investigation for the South Chestnut Wind Farm project.

Attentive Energy New York Blight Lease Area*
Role: Task Manager/Lead Tribal Engagement Specialist
Duties included serving as lead tribal contact and coordinator with numerous federally recognized tribal organizations for Attentive Energy's lease in the New York Bight Lease Area.

Confidential Offshore Wind Farm, New York*
Role: Tribal Liaison/Project Manager (Maritime and Terrestrial)
Large offshore wind project off the coast of New York. Duties include serving as lease-holder liaison for tribal coordination with 16 federally recognized tribal organizations, as well as community development liaison on tribal affairs.

Confidential Offshore Wind Farm, Connecticut, Rhode Island, and New York*
Role: Tribal Liaison/Project Manager (Maritime and Terrestrial)
Large offshore wind project off the coast of Connecticut, Rhode Island, and New York. Duties include serving as lease-holder liaison for tribal coordination with 16 federally recognized tribal organizations, as well as community development liaison on tribal affairs.

Eric P. Scuoteguazza

Principal and Corporate Cultural Resources Practice Lead

Confidential Offshore Wind Farm, New Jersey and New York*
Role: Task Manager (Maritime and Terrestrial)
Large offshore wind project off the coast of New Jersey and New York. Duties include overseeing land-based archaeological investigations for compliance under the National Historic Preservation Act to meet BOEM requirements. Duties also include serving as lease-holder liaison for tribal coordination with 17 federally recognized tribal organizations.

Confidential Offshore Wind Farm, New Jersey*
Role: Task Manager/Principal Investigator (Maritime and Terrestrial)
Large offshore wind project off the coast of New Jersey. Duties include designing, managing, and overseeing land-based archaeological investigations under the National Historic Preservation Act to meet BOEM requirements.

New Power Plant Construction, Alta Power, LLC, Lufkin, Texas*
Role: Cultural Lead
New construction of a power generation facility within a 24-acre parcel.

Transmission Line Extension Project, Sargent & Lundy, Inc./American Electric Power Company, Laporte County, Indiana*
Role: Cultural Lead
Marquette Extension of the New Carlisle-Bosserman transmission line improvements project in Laporte County, Indiana.

Confidential Project in Southern California*
Role: Cultural Lead
Due diligence for a coastal power generation facility closure, per CEQA.

License Renewal Audit for Beaver Valley Power, FirstEnergy Nuclear Operating Company, Beaver County, Pennsylvania*
Role: Project Manager/Principal Investigator
Nuclear Regulatory Commission Subject Matter Expert

Confidential Project in Northern California for Power Generation and Electric Distribution*
Role: Cultural Lead
Duties included QAQC, subconsultant management, and overseeing cultural resource specialists to provide cultural resources compliance under NHPA and CEQA.

PG&E Accelerated Wildfire Risk Reduction Program, California*
Role: Cultural Lead/Task Manager
Responsibilities included QAQC, agency consultation, field guidance development for tree-clearing crews, subconsultant management, and overseeing cultural specialists for vegetation maintenance along electric distribution infrastructure in Tier 3 High Fire Threat Areas in California.

Cultural Resources Survey, Kemptown Substation, Potomac-Appalachian Transmission Highline (PATH), Power Engineers, Frederick County, Maryland*
Role: Task Manager/Principal Investigator

FERC 7(c) Phase I/II, and Phase III Data Recovery, H-162 Pipeline Project, Dominion Transmission, Inc., Kanawha County, West Virginia*
Role: Task Manager

Cultural Resources Survey, Virginia State Line-Meadowbrook and Meadowbrook Substation-Appalachian Trail Segments of the Trans-Allegheny Interstate Line (TrAIL) Project, Power Engineers, Inc., Frederick and Warren Counties, Virginia*
Role: Lead Archaeologist

Beaver Valley Power Station, Beaver County, Pennsylvania*
Role: Project Manager/Principal Investigator

Eric P. Scuoteguazza

Principal and Corporate Cultural Resources Practice Lead

Served as Subject Matter Expert for a Nuclear Regulatory Commission license renewal audit, which included conducting public meetings with residents, local governments, and other stakeholders.

FERC 7(c) Phase I/II (and 12 Addenda) Cultural Resources Investigations on Big Sandy Pipeline, Equitable Resources, Carter, Floyd, Lawrence and Johnson Counties, Kentucky*
Role: Principal Investigator/Author

FERC 7(c) Cultural Resource Investigations and Phase II National Register Evaluations, Appalachian Gateway Project, Dominion Transmission, Inc., Greene, Washington, Allegheny, Westmoreland Counties, Pennsylvania*
Role: Group Manager/Principal Investigator

Public Sector

Grand River Revitalization Project, USDA, Grand Rapids, Michigan*
Role: Cultural Lead/Task Manager

PennDOT Section 106 Compliance*
Federally delegated as a PennDOT Qualified Professional Archaeologist, responsible for all regulatory aspects of Section 106 compliance on behalf of the Federal Highway Administration in three PennDOT Engineering Districts.

Carrie Blast Furnace Cultural Resources Studies, Redevelopment Authority of Allegheny County, Pittsburgh, Pennsylvania*
Role: Group Manager/Principal Investigator
Cultural resources studies and oversight on a 178-acre brownfield parcel for the Redevelopment Authority of Allegheny County, PA. Duties included creation of a project-specific procedural agreement for NHPA compliance, construction monitoring, and high-level federal consultation on behalf of the U.S. Department of Housing and Urban Development. Special consideration was needed for a National Historic Landmark on-site, which is the Carrie Blast Furnace.

North Carolina Hurricane Relief*
Role: Cultural Lead
Damage Survey Reporting (DSR) and compliance on behalf of the United States Department of Agriculture, Natural Resources and Conservation Service.

City of Vallejo Historic Preservation Planning and CEQA Review, Cultural Lead*
Historic preservation planning and CEQA review for large-scale divestiture and remediation project. Duties included QAQC for compliance and baseline data synthesis.

Historic Preservation Planning Services for the City of Lake Helen Historic District, Volusia County, Florida*
Role: Project Manager/Facilitator
Responsibilities included survey and reporting, public outreach and meetings, and establishing standards and guidelines for inclusion into local ordinance.

Myoma Bridge #1, Pennsylvania Department of Transportation, Engineering District 10-0, Butler County, Pennsylvania*
Role: Cultural Resources Task Manager
Phase I Cultural Resources Survey

South Shippenville Bridge Relocation, Pennsylvania Department of Transportation, Engineering District 10-0, Clarion County, Pennsylvania*
Role: Cultural Resources Task Manager
Phase I Cultural Resources Survey

Phase III Data Recovery excavations at East Steubenville Site, West Virginia Division of Highways, Brooke County, West Virginia*
Role: Field Supervisor/Co-Author/Artist

Phase III Data Recovery excavations at East Steubenville Site, a Panhandle Archaic shell midden, habitation, and mortuary site in Brooke County, West Virginia. Duties included exhumation of numerous well-preserved Archaic burials, stabilization of human remains, and repatriation in close coordination with the West Virginia Division of the Federal Highway Administration and federally recognized tribal organizations (Eastern Band of Cherokee Indians and the Onondaga Nation of the Haudenosaunee Federation).

Federal Aid Highway Program*
Role: In-house Qualified Professional/Compliance Officer
Duties included: 1) serving as federal delegate on all NHPA responsibilities of the Federal Highway Administration, 2) serving as sole tribal contact acting as a federal agent on a nation-to-nation level with numerous federally recognized tribal organizations in the Southwest, Midwest, and Eastern US within a portfolio of over 300 Federal Aid highway projects under formal Federal Highway Administration delegation, 3) development of statewide procedural agreements for proper tribal consultation with numerous federally recognized tribes, and 4) development of statewide tribal mapping and tribe-specific profiles for numerous federally recognized tribal organizations. Collaboration with tribal leaders and representatives was a key component of this task, which allowed responsible regionally based guidelines.

In-house Qualified Professional/Compliance Officer*
Duties included serving as sole tribal contact serving as a federal agent on a nation-to-nation level with numerous federally recognized tribal organizations in the Southwest, Midwest, and Eastern US within a portfolio of over 300 Federal Aid highway projects under formal Federal Highway Administration delegation. Duties included development of statewide procedural agreements for proper tribal consultation acting on a nation-nation level with numerous federally recognized tribal organizations in the Southwest, Midwest, and Eastern US under formal Federal Highway Administration delegation. Duties included development of statewide tribal mapping and tribe-specific profiles for numerous federally recognized tribal organizations in the Southwest, Midwest, and Eastern US under formal Federal Highway Administration delegation. Collaboration with tribal representatives was a key component of this task, and the results allowed responsible regionally based guidelines for appropriate nation-to-nation engagement.

Perry's Victory and International Peace Memorial, Ottawa County, Ohio*
Role: Project Manager/Principal Investigator
Maritime and terrestrial archaeological investigations at the Perry's Victory and International Peace Memorial (PEVI) at Put-in-Bay in Lake Erie in support of the National Park Service (NPS) proposed restoration seawalls.

H2Ohio Sandusky Bay Restoration Initiative Nutrient Reduction Wetland Project, Erie, Ottawa, and Sandusky Counties, Ohio*
Role: Senior Project Manager/Principal Investigator
Maritime and Phase I/II terrestrial archaeological investigations in and along the shores of Sandusky Bay on behalf The Nature Conservancy.

Real Estate
Appalachian Gateway Project, Greene, Washington, Allegheny, and Westmoreland Counties, Pennsylvania*
Role: Group Manager/Principal Investigator
Responsibilities included FERC 7(c) Cultural Resource Investigations, Phase II National Register Evaluations, multiple historic cemetery delineations, and tribal consultation.

Confidential Human Interments Removal, West Virginia*
Role: Group Manager
Monitoring and Removal of over 80 precontact-era human interments, including tribal engagement for appropriate treatment of remains.

Carrie Furnace Development, Allegheny County, Pennsylvania*
Role: Group Manager/Principal Investigator
Cultural resources studies and oversight on a 178-acre brownfield parcel for the Regional Industrial Development Corporation. Duties included creation of a project-specific procedural agreement for compliance with the National Historic Preservation Act, construction monitoring, and high-level federal consultation on behalf of the U.S. Department of Housing and Urban Development. Special consideration was needed for a National Historic Landmark on-site, which is the Carrie Blast Furnace.

Eric P. Scuoteguazza

Principal and Corporate Cultural Resources Practice Lead

River Avenue Redevelopment Project, Allegheny County, Pennsylvania*
Role: Field Supervisor/Author
Phase III Archaeological Data Recovery and Construction Monitoring on behalf of the Pittsburgh Urban Redevelopment Authority. Duties included extensive excavation and synthesis of a well-preserved 19th century tannery, as well as a producing a predictive model for identifying and interpreting tannery-related archaeological features.

Hazelwood Urban Redevelopment, City of Pittsburgh, PA*
Role: Group Manager/Principal Investigator
Cultural resources studies and oversight on a 200-acre brownfield parcel for an urban redevelopment client in Hazelwood, PA. Duties included NHPA compliance and high-level federal consultation. Consideration was needed for industrial historic properties associated with coke production and steelworks.
** Work performed prior to joining CEC*

PROFESSIONAL AFFILIATIONS

Register of Professional Archaeologists

Pennsylvania Archaeological Council

Business Network for Offshore Wind

Society of American Military Engineers

Federal Delegation for Section 106 Compliance

American Society of Highway Engineers

RESEARCH SPECIALIZATION

Policy and Procedures on Tribal Consultation

Best Practice Business Management

Woodland Ceremonial Sites (with NPS support)

North American Archaeology

Leather Tanning Features and Site Design

Antler Projectile Point Technology

Lisa Mash, PMP
Senior Project Manager

27 YEARS OF EXPERIENCE

EDUCATION

B.S., Marine Biology, University of South Carolina, 1995

EXPERTISE

Specialist in NEPA/CEQA compliance & preparation of NEPA (CATEX, EA, EIS) / CEQA (IS, MND, EIR) documents

Specialist in Endangered Species Act Section 7 / Section 10 consultation & preparation of BAs and HCPs

FERC Section 7(c) of the Natural Gas Act experience (Pre-filing Process / Environmental Reports)

Manage large environmental compliance projects with a cross functional team

Over 25 years of professional experience in the environmental consulting industry specializing in National Environmental Policy Act (NEPA) compliance, Endangered Species Act (ESA) Section 7 and 10 consultation, and environmental permitting support in coordination with U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS or Service), National Marine Fisheries Service (NMFS), Department of Housing and Urban Development (HUD), Department of Energy (DOE), Bureau of Land Management (BLM), and Federal Energy Regulatory Commission (FERC). As Senior Project Manager, Ms. Mash has had full responsibility for the successful completion of services in support of Environmental Impact Statements (EISs)/Environmental Assessments (EAs), Environmental Reviews (ERs), Critical Issues Analysis (CIA), and Biological Assessments (BAs) including oversight of a complex project team, work product development; coordination with lead agencies at the federal, state, and local level; and overall management of the environmental review process. Her extensive experience includes permitting and compliance for the construction and operation of natural gas and petroleum pipelines and storage facilities, transportation projects at the state and federal level, coastal restoration projects, marine terminals, power lines, water transmission and distribution facilities, landfill expansions, and master plan activities for municipalities.

Environmental / NEPA Compliance Experience

Environmental Assessment for Greenway Waste Solutions at North Meck, LLC Landfill Expansion (North Meck Diamond), Mecklenburg County, North Carolina
Role: NEPA Project Manager
Greenway Waste Solutions, LLC is proposing to increase the airspace capacity and life expectancy of the current North Meck Diamond Landfill. Given the current waste acceptance rate, North Meck Diamond's current disposal capacity is projected to expire within approximately 1-2 years. As NEPA Project Manager, Ms. Mash oversees the execution of the scope of services including preparation of ab EA, Environmental Justice assessment, public/stakeholder outreach, and agency consultation.

Permitting Services for Republic Services of North Carolina's (Republic) White Oak Landfill Phase 6 Expansion, Haywood County, North Carolina
Role: Environmental Permitting Lead
Republic is proposing to increase White Oak Landfill's current disposal capacity through a lateral expansion. The proposed expansion is needed to provide additional airspace or waste capacity for another 12 years to meet the continued and growing demand of the service area in western North Carolina. As Project Manager, Ms. Mash oversees the execution of the scope of services including environmental permitting (Section 404/401, road encroachment, and county land disturbance permits) and agency consultation.

Environmental Assessment for Howard Energy Partners (HEP) FOA 2610 CarbonSAFE CO_2 Pipeline Project, Corpus Christi, Texas
Role: Project Manager

Lisa Mash, PMP
Senior Project Manager

Serving as a third-party contractor to DOE, CEC is assisting with preparation of an EA for the Coastal Bend Carbon Management Project in accordance with the Council on Environmental Quality's (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) and DOE's NEPA compliance regulations (10 CFR Part 1021). As Project Manager, Ms. Mash is responsible for development of the EA; coordination with resource agencies at the federal, state, and local level; and public outreach and engagement efforts.

Environmental Assessment for Kerr-McGee Superfund Remediation Project, City of West Chicago, Illinois
Role: NEPA Project Manager
Using HUD Economic Development Initiative, Community Project grant funds, the City of West Chicago (City) intends to develop a new community park at the Kerr-McGee Superfund Site in DuPage County. As NEPA Project Manager, Ms. Mash is assisting the City with preparation of the EA/FONSI pursuant to 24 CFR Section 58.5, agency coordination, Environmental Justice (EJ) Assessment, and filing of the Environmental Review Record (ERR).

Environmental Assessment for the Patriot's Farm Project, Norton, Massachusetts
Role: NEPA Project Manager
Using HUD Economic Development Initiative, Community Project grant funds, the Massachusetts Military Support Foundation Inc. (MMSFI) is proposing to build a new food bank and vocational center for Veterans and Military families in the Town of Norton, referred to as the Patriot's Farm Project. As NEPA Project Manager, Ms. Mash is assisting MMSFI with preparation of the EA/FONSI pursuant to 24 CFR Section 58.5, agency coordination, EJ Assessment, and filing of the ERR.

Environmental Information Volume for CONSOL Energy's 21st Century Power Plant Project, Pennsylvania and West Virginia
Role: Deputy Project Manager
As Deputy Project Manager, Ms. Mash assisted with development of the Environmental Information Volume (EIV) for CONSOL Energy's 21st Century Power Plant Project as per the Department of Energy's NETL F45.1-1/6 environmental guidelines. The EIV is intended to provide initial environmental data, including existing conditions and potential impacts to resources (i.e., air quality, water resources, threatened and endangered species, solid waste, etc.), associated with the proposed power plant site and potential alternative locations. Ms. Mash is also supporting preparation of the Public Engagement Plan.

Environmental Assessment (EA) for Van Meter Land Reclamation Project, Arkansas Department of Energy and Environment, Franklin County, Arkansas
Role: NEPA Lead
As NEPA lead, Ms. Mash assisted with development of the EA for the Arkansas Department of Energy and Environment as per the Department of Interior's Office of Surface Mining Reclamation and Enforcement (OSMRE) environmental guidelines. The site was previously mined for coal in the 1960s and 1970s. Proposed project activities include the reclamation of a hazardous water body that contains the two dangerous highwalls. Ms. Mash is also responsible for agency coordination and public engagement.

USACE Third-Party Environmental Impact Statement (EIS) for Jasper Ocean Terminal (JOT), South Carolina Ports Authority and Georgia Ports Authority, South Carolina and Georgia
Role: Project Manager
As Project Manager, Ms. Mash oversaw development of the draft NEPA document in concert with the USACE Charleston District; overseeing a complex project team; coordination with resource agencies at the federal, state, and local level; and overall public outreach and engagement efforts. The JOT Joint Venture, a partnership between the Georgia Ports Authority (GPA) and the South Carolina Ports Authority (SCPA), is proposing to build and operate a marine container terminal on an approximately 1,500-acre site along the north bank of the Savannah River in Jasper County, SC. Components of the JOT would include conventional terminal components such as vessel access, waterside transfer zones, storage locations, truck transfer zones, an intermodal container transfer facility, a building program, truck gates, transportation connectivity routes, and various marine container terminal support areas. The EIS is to assess the potential social, economic, and environmental effects of the proposed construction and operation of a marine container terminal.

Supplemental Environmental Assessment (EA) for Helicopter Ramp Expansion at Moody Air Force Base, Moody AFB, Georgia
Role: Project Manager

Lisa Mash, PMP
Senior Project Manager

As Project Manager, Ms. Mash was responsible for development of the SEA and FONSI/FONPA; coordination with agencies at the federal, state, and local level; and public outreach and engagement. The proposed project is the expansion of a helicopter parking ramp south of the proposed HH-60 and HC-130J hangar a s part of Moody AFB's Personnel Recovery Campus Project. The SEA evaluated potential impacts to wetlands, water quality, and noise from the proposed expansion.

USACE Third-Party Environmental Impact Statement (EIS) for Navy Base Intermodal Container Transfer Facility (ICTF), Palmetto Railways and USACE Charleston District, North Charleston, South Carolina
Role: QA/QC Director
Ms. Mash assisted in the preparation and production of the EIS led by the USACE Charleston District with the Federal Railroad Administration (FRA) and EPA as cooperating agencies. The EIS addressed potential impacts associated with the construction and operation of the proposed ICTF by Palmetto Railways and to verify that the EIS met USACE Charleston District standards and expectations, and in accordance with the NEPA and the FRA Procedures (64 FR, 28545). The intermodal facility would consist of processing and classification railroad tracks, wide-span gantry cranes, container stacking areas, administrative buildings, and vehicle driving lanes.

USACE Third-Party Environmental Impact Strategy (EIS) for the Proposed Port of Gulfport Expansion Project, Harrison County, Mississippi
Role: QA/QC and Technical Director
Assisted in the preparation and production of the EIS to address potential impacts associated with the construction and operation of the Port of Gulfport Expansion Project by the Mississippi State Port Authority and to verify that the EIS met USACE Mobile District standards and expectations. The project addresses up to 282 acres of estuarine mud and sand bottom habitat in the Mississippi Sound, the construction of wharfs, bulkheads, terminal facilities, container storage areas, intermodal container transfer facilities, dredging and dredged material disposal and infrastructure, and construction of a breakwater of approximately 4,000 linear feet.

USACE Third-Party Supplemental EIS (SEIS) for the Haile Gold Mine Proposed Expansion Project, Haile Gold Mine, Inc., South Carolina
Role: NEPA Advisor
As NEPA Advisor, Ms. Mash assisted with preparation of sections of the Supplemental EIS (SEIS), including affected environment and environmental consequences sections, for the USACE Charleston District, public scoping, agency coordination, and stakeholder outreach. Haile Gold Mine, Inc., a subsidiary of Oceana Gold Corporation, proposes to expand mining operations at their existing Haile Gold Mine located in Lancaster County, SC. The project includes expansion of surface mining and associated mine pits and overburden storage facilities, initiation of underground mining at the Horseshoe deposit, and increased ore processing through optimization of the mill and related infrastructure including expansion of the water management system and existing tailings storage facility.

Department of Homeland Security Federal Law Enforcement Training Center (FLETC) Environmental Assessment, WGL Energy, Maryland
Role: QA/QC Technical Director
As QA/QC Technical Director, Ms. Mash assisted in the preparation and production of the EA. The project involves construction and operation of a 1.8 MW alternating current PV system on 12 acres of land in the northwestern corner of the FLETC in Cheltenham, Maryland to assist the DHS and FLETC to decrease energy costs, ensure long-term energy price stability, and to reduce reliance upon fossil fuels and environmental impacts. The main resources analyzed as part of the EA included air quality, noise, visual resources, cultural resources, and sustainability and resilience.

Coyote Springs Investment Multi-Species Habitat Conservation Plan/Environmental Impact Statement (EIS), Lincoln County, NV
Role: Deputy Project Manager
Coyote Springs Investment (CSI), USFWS, and BLM were engaged in an iterative, cooperative process to develop a MSHCP, EIS, and ESA Section 7 Biological Assessment. As Deputy Project Manager, Ms. Mash assisted the project manager with strategic guidance, oversight, and assistance to CSI to ensure that the MSHCP/EIS document was consistent with the guidance documents related to ESA and NEPA while assisting CSI to ensure the timely completion of the MSHCP. This project included the development of a planned environmental sensitive community on approximately14,000 acres of land in rural Nevada.

Lisa Mash, PMP
Senior Project Manager

PROFESSIONAL AFFILIATIONS

National Association of Environmental Professionals

Project Management Institute, Project Management Professional (PMP Number 3157202)

The Society of American Military Engineers

PUBLICATIONS

Chapman, R.W., Ball, A.O., and Mash, L.R. Spatial Homogeneity and Temporal Heterogeneity of Red Drum (Sciaenops ocellatus) Microsatellites: Effective Population Sizes and Management Implications. Marine Biotechnology (4, 589-603). 2002.

Nicholas L. Shepherd, Ph.D., P.E.

Project Manager I

10 YEARS OF EXPERIENCE

EDUCATION

B.S., Environmental Engineering, University of Oklahoma, 2016

M.S., Civil Engineering, University of Oklahoma, 2017

Ph.D., Environmental Engineering, University of Oklahoma, 2022

Dr. Shepherd has over a decade of experience conducting research in environmental engineering and environmental science. Primary responsibilities include field data collection, data management, statistical analyses, and preparing technical documents. Primary areas of experience include extensive experience in abandon mining projects including stream and biological assessments, groundwater and mine pool monitoring, surface water and mine drainage characterization, and sediment characterization; highwall and hazardous water body remediation; closure of C&D solid waste facilities; industrial stormwater design.

PROJECT EXPERIENCE

Abandoned Mine Lands

Brotherton Highwall AML Reclamation, ADEE, Branch, AR

Role: Staff Consultant

I generated the design specifications, and I designed a rock cross vane to prevent further erosion on the stream flowing through the project site. I also generated the project specifications and oversaw construction. The project objective was to remediate a highwall from an abandoned coal mine that was partially submerged under a pond, with a stream feeding the pond.

Montreal GOB Pile, ADEE, Montreal, AR

Role: Staff Consultant

This project consisted of installing a cover layer over an existing GOB pile from abandoned coal mining operations in Montreal, Arkansas. The cap prevented water infiltration to eliminate downstream contamination. Dr. Shepherd Performed the stormwater calculations for the site design and prepared the specifications package. He also conducted site observations during the construction phase and reviewed change orders and invoices from the contractor.

Van Meter AML Highwall Reclamation, ADEE, Branch, AR

Role: Staff Consultant

This project focused on remediation of an abandoned coal mining pit. I created the site grading plan to remediate the dangerous highwall associated with the pit. I also designed a stream channel to repair a highly eroded channel on the project site, including calculating the flow rates of various return interval storms, then calculating the shear stream and sizing the riprap needed to dissipate the energy of the water using the Striker equation. I also wrote the project specifications and generated the construction cost estimate for the project.

EXPERTISE

Mine drainage and mine pool characterization

Mine drainage passive and semi-passive treatment design

REGISTRATIONS

Professional Engineer

- OK 33613
- CO 0064619
- AR 22887
- KS 30792
- IN PE12400723

CERTIFICATIONS

MSHA New Miner Training, Mine Safety and Health Administration

10-Hour OSHA Construction Safety (Occupational Safety & Health Administration), OSHA

40-Hour OSHA HAZWOPER, 360 Training

SafeLand USA - Basic Orientation, PEC Safety

8-Hour HAZWOPER Supervisor Training, National Environmental Trainers, Inc.

8-Hour OSHA HAZWOPER Refresher Training, 360 Online

Nicholas L. Shepherd, Ph.D., P.E.

Project Manager I

Beaulah Highwall Reclamation, ADEE, Hartford, AR

Role: Staff Consultant

This project was an abandoned mine lands site that focused on remediation of an abandoned coal mining pit. I created the site grading plan to remediate the dangerous highwall associated with the pit. I performed stormwater calculations to determine watershed contribution and evaluate the existing and proposed flows contributing to existing culverts. I also prepared the construction drawing set, a construction cost estimate, and specifications package for the project.

Research

Doctoral Research Project, University of Oklahoma, Picher, Oklahoma*

Role: Graduate Research Assistant

Dr. Shepherds doctoral research was conducted in the Tri-State Mining District at the Tar Creek Superfund Site. He assessed the recovery of fish communities in a tributary to Tar Creek historically impacted by mine drainage following the implementation of passive treatment systems that treat the mine drainage discharges before entering the tributary. He also performed habitat, benthicmacroinvertebrate, and fish assessments at six locations along Tar Creek to evaluate the impact of contamination from the Superfund site on the aquatic community. Lastly, he collected samples and analyzed water quality data to characterize the largest untreated mine drainage discharges at the superfund site and developed a conceptual design utilizing nature-based solutions capable of remediating these discharges with a 90% treatment efficiency by volume. Dr. Shepherds research showed that Tar Creek was not irreversibly damaged and has resulted in the start of an initial site investigation led by EPA to evaluate the feasibility of implementing the conceptual design.

EVALUATION OF FISH ASSEMBLAGES OF THE CRUTCHO CREEK DRAINAGE , Tinker Airforce Base, Oklahoma City, OK*

Role: Graduate Research Assistant

Dr. Shepherd served as a field technician collecting fish at multiple locations throughout the Crutcho Creek drainage basin, which includes Tinker Airforce Base, over a period of two years to evaluate fish communities and habitat conditions compared to a fish survey performed a decade prior. The objective was to determine if changes in fish communities were related to habitat and land use changes within the watershed and if there were any substantial changes in fish communities comparing sites upstream and downstream of the base.

Solid Waste

Finley Buttes RD&D, Waste Connections, BOARDMAN, OREGON

Role: Staff Consultant

I analyzed data from the leachate quality of the landfill, the collection system, groundwater pumping, and waste disposal quantities. Then wrote a comprehensive report. The project is a research development and demonstration project to evaluate utilizing liquid waste as a method to promote the decomposition of the landfill material without causing serious issues with the landfills generated leachate.

Pauls Valley C&D Landfill Final Closure, City of Pauls Valley, Pauls Valley, OK

Role: Staff Consultant

I designed the final covers in AutoCAD and designed the entire stormwater management system, including two sedimentation ponds, swales, and letdown structures. The project objective was to design the final closure system for the landfill.

Negus Transfer Station, Deschutes County, Redmond, OR

Role: Staff Consultant

I designed the stormwater and leachate collection system, along with Kenia De'Leon. This project was the design of a new solid waste transfer station near Redmond, OR. I performed the design of the stormwater and leachate collection systems. The design was a phased design, with the first phase including a 40,000 sq. ft transfer station, weigh station, roadways, and sidewalks. The contributing area from phase 1 was approximately 7.5 acres, with an additional 4.0 acres of area contributing to the phase 1 drainage system in the future phases. I calculated the runoff for the 100-year rainfall event from all contributing drainage areas (phase 1 and future phases) using the modified rational method. I designed and analyzed the drainage system using Manning's equation to convey the 100-year rainfall event. The conveyance system that I designed included trapezoidal channels, 18" and 24" culverts, and stormwater pipes ranging from 12" to 18". I checked velocities of the stormwater to ensure my design was in compliance with local and state guidelines and to size the energy dissipators at the outfalls of the conveyance structures. I completed similar calculations for the design of the leachate collection system. I then designed the evaporation ponds for both the stormwater and the leachate collection systems. The stormwater evaporation facility was sized to accommodate the 100-yr, 24-

hour rainfall event so the client would not need a discharge permit. The evaporation facility was sized using a two-year water cycle budget through an iterative process to ensure evapotranspiration rates could evaporate all stormwater, including a 100-yr, 24-hour rainfall event, on an annual basis. I designed the emergency overflow structure, consisting of a broad crested, trapezoidal weir that was sized to bypass a 500-yr rainfall event. I then modeled the entire stormwater system that I design in AutoDesk Storm and Sanitary Sewer Analysis (SSA) to verify my design would function as intended. Lastly, I wrote a drainage report, detailing my design, to be used during the permitting process of the transfer station.

Finley Buttes RD&D 2021, Waste Connections, BOARDMAN, OREGON
Role: Staff Consultant
This project was the evaluation of an ongoing research development and demonstration (RDD) project that allowed a solid waste landfill to accept liquid waste to inject and surface apply to the landfill in order to promote the breakdown of the landfill because it is located in a very arid region of Oregon. I reviewed and analyzed multiple datasets, including solid and liquid waste quantities and the chemical composition of the liquid received by the landfill, groundwater quantity data, leachate quantity and quality data generated by the landfill, and gas flow records. I summarized the data to determine if the project was continuing to meet its RDD objectives, which included calculating the absorption capacity and the moisture balance of the landfill. I then wrote the annual report for the project and submitted it to the Oregon DEQ.
** Work performed prior to joining CEC*

TRAINING

ASTM E1527 Phase 1 Environmental Site Assessment for Commercial Real Estate

AWARDS

2021 Recipient of the Mike Synar Environmental Excellence Award, Local Environmental Action Demanded, Miami, OK

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

American Society of Mining and Reclamation

Oklahoma Clean Lakes and Watersheds Association

Tau Beta Pi - The Engineering Honor Society

PUBLICATIONS

Shepherd, N.L., and R.W. Nairn. “Metals Retention in a Net Alkaline Mine Drainage Impacted Stream Due to the Colonization of the North American Beaver (Castor canadensis)”. Science of the Total Environment. 731:1-7. DOI: https://doi.org/10.1016/j.scitotenv.2020.139203, 2020.

Shepherd, N.L., C.F. Denholm, M.H. Dunn, C.A. Neely, T.P. Danehy, and R.W. Nairn. “Biogeochemical Analysis of Spent Media from a 15-Year Old Passive Treatment System Vertical Flow Bioreactor”. Mine Water and the Environment. 39: 68-74. doi: 10.1007/s10230-020-00652-3, 2020.

Strosnider, H.J., J. Hugo, N.L. Shepherd, B.K. Holzbauer-Schweitzer, P.Hervé-Fernández, C. Wolkersdorfer, and R.W. Nairn. “A Snapshot of Coal Mine Drainage Discharge Limits for Conductivity, Sulfate, and Manganese across the Developed World”. Mine Water and the Environment. 39:165-172. doi: https://doi.org/10.1007/s10230-020-00669-8, 2020.

Shepherd, N.L., and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Colonization on a Mine Drainage Impacted Stream”. Conference Proceedings - 11th International Conference on Acid Rock Drainage and the International Mine Water Association: Risk to Opportunity. Pretoria, South Africa. 849-855, 2018.

Nairn, R.W., N.L. Shepherd, T. Danehy, C. Neely. “Aeration via Renewable Energies Improves Passive Treatment System Performance”. Conference Proceedings - 11th International Conference on Acid Rock Drainage and the International Mine Water Association: Risk to Opportunity. Pretoria, South Africa. 151-156, 2018.

Shepherd, N.L., and R.W. Nairn (2021) Induced mobilization of stored metal precipitates from beaver (Castor canadensis) created wetlands on a mine drainage impacted stream. Wetlands Ecology and Management. DOI: 10.1007/s11273-021-09839-z.

Shepherd, N.L., E. Keheley, R.C. Dutnell, C.A. Folz, B. Holzbauer-Schweitzer, R.W. Nairn (2022) Picher Field Underground Mine Workings of the Abandoned Tri-State Lead-Zinc Mining District in the United States. Journal of Maps. DOI: 10.1080/17445647.2022.2057877

PRESENTATIONS

Nairn, R.W., N.L. Shepherd, B.K. Holzbauer-Schweitzer, and Z. Tang. “Ecological Engineering by Humans and Beavers: How Small Ponds and Wetlands Can Improve Watershed Water Quality” 27th Annual Conference, Oklahoma Clean Lakes and Watersheds Association, Stillwater, OK, March 2019.

Shepherd, N.L., and R.W. Nairn “Locating and Characterizing Mine Drainage Sources in a Topographically Challenging Location at the Tar Creek Superfund Site, Oklahoma”. 2019 National Meeting of the American Society of Mining and Reclamation, Big Sky, MT, June 3-7, 2019.

Shepherd, N.L., and R.W. Nairn “Water Quality and Quantity Characterization of Mine Drainage Sources Near Douthat, Oklahoma”. 21st Annual National Environmental Conference at Tar Creek, Miami, OK, September 17-18, 2019.

Holzbauer-Schweitzer, B.K., N.L. Shepherd, and R.W. Nairn “Reclamation in the Heartland: Cleaning up the Tar Creek Superfund Site”. 21st Annual National Environmental Conference at Tar Creek, Miami, OK, September 17-18, 2019.

Nairn, R.W., N.L. Shepherd, B.K. Holzbauer-Schweitzer, A.L. Sikora, Z. Tang, A. Arango, D. Nguyen, T. Wall, and R.C. Knox. “Ecotoxic Trace Metal Mass Retention in Mine Water Passive Treatment Systems at the Tar Creek Superfund site”. 2018 Oklahoma Clean Lakes and Watersheds Association Conference, Stillwater, OK, April 4-5, 2018.

Shepherd, N.L., and R.W. Nairn. “Recovery of Fish Populations in an Unnamed Tributary to Tar Creek After the Implementation of Two Passive Treatment Systems”. 2018 Oklahoma Clean Lakes and Watersheds Association Conference, Stillwater, OK, April 4-5, 2018.

Nairn, R.W., and N.L. Shepherd. “Hydrologic Budgets and Conservative Ions: Potentially Important Yet Neglected Tools in the Evaluation of Passive Treatment System Effectiveness”. 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3-7, 2018.

Nairn, R.W., B.J. Page, and N.L. Shepherd. “Targeted Maintenance Efforts to Ensure a Decade of Successful Passive Treatment”, 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3-7, 2018.

Nairn, R.W., N.L. Shepherd, T. Danehy, and C. Neely. “Aeration via Renewable Energies Improves Passive Treatment System Performance”, 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3-7, 2018.

Shepherd, N.L., and R.W. Nairn. “Metals Retention and Remobilization in a Small Mine Drainage Impacted Stream Colonized by Castor canadensis (North American Beaver)”. 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3-7, 2018.

Shepherd, N.L., W.J. Matthews, and R.W. Nairn. “Measuring the Recovery of Fish Communities in a First Order Stream to Tar Creek After Implementation of Two Passive Treatment Systems”. 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3-7, 2018.

Nairn, R.W., R.C. Knox, and N.L. Shepherd. “Hydrologic Budgets and Conservative Ions: Neglected Tools in Ecologically Engineered Treatment System Performance Evaluation”. 18th Annual American Ecological Engineering Society Meeting, Houston, TX, June 12-14, 2018.

Nairn, R.W., N.L. Shepherd, T. Danehy, and C. Neely, “Aeration via Renewable Energies Improves Passive Treatment System Performance”. 2018 International Meeting of the International Mine Water Association, Pretoria, South Africa: Risk to Opportunity, September 10-14, 2018.

Shepherd, N.L., and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Colonization on a Mine Drainage Impacted Stream”. 2018 International Meeting of the International Mine Water Association, Pretoria, South Africa: Risk to Opportunity, September 10-14, 2018.

Nairn, R.W., J. Labar, L. Oxenford, B.J. Page, and N.L. Shepherd. “Stream recovery in a mining-impacted watershed: Ecotoxic metal removal in passive treatment systems through targeted mechanisms in multiple process units”, Conference Proceedings: 2017 Annual Meeting of the American Ecological Engineering Society, Ecological Engineering for Adaptation in the Anthropocene, Athens, GA, May 23-25, 2017.

Shepherd, N.L., and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Repopulation on a Mine Drainage Impacted Stream”. 2017 Oklahoma Student Water Conference, Stillwater, OK, March 23-24, 2017.

Nairn, R.W., T. Danehy, C. Neely, R. Dutnell, B. Page, N.L. Shepherd, D. Cates and B. Stanila. “Challenges of Designing and Building a Passive Treatment System with Limited Topography, Hydraulic Head and Available Land Area”. 2017 Joint Conference of the American Society of Mining and Reclamation (ASMR), Appalachian Regional Reforestation Initiative (ARRI) and West Virginia Mine Drainage Task Force (WVMDTF), Morgantown, WV, April 2017.

Shepherd, N.L., and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Repopulation on a Mine Drainage Impacted Stream”. 2017 National Meeting of the American Society of Mining and Reclamation, Morgantown, WV: What’s Next For Reclamation?, April 9-13, 2017.

Matthews, W.J., R.W. Nairn, N.L. Shepherd, Z. Zbinden, A. Geheber, and E. Marsh-Matthews. “Fishes of a Heavy Metal Contaminated Stream (Tar Creek, Ottawa County, Oklahoma) After Operation of a Passive Treatment System for a Decade – and a ‘New Opportunity’”. American Fisheries Society, Southern Division Meeting, Oklahoma City, OK, February 2017.

Shepherd, N.L., and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Repopulation on a Mine Drainage Impacted Stream”. 2017 National Environmental Tar Creek Conference, Climate of Denial, Miami, OK, September 26-27, 2017.

Shepherd, N.L. and R.W. Nairn. “The Effects of Castor canadensis (North American Beaver) Repopulation on a Mine Drainage Impacted Stream”. 19th National Tar Creek Conference, Miami, OK, September 2017. (poster)

Page, B.J., N.L. Shepherd, and R.W. Nairn, “Design and Construction Challenges for the Southeast Commerce Passive Treatment System”. 25th Annual Conference, Oklahoma Clean Lakes and Watersheds Association, Stillwater, OK, March 2016. (poster)

Shepherd, N.L., and R.W. Nairn. “Fishes of a Contaminated Steam After Operation of a Passive Treatment System”. Oklahoma Clean Lakes and Watersheds Association, Valuing Water: Economics, Ecology, and Culture, March 29-30, 2016.

Shepherd, N., R.W. Nairn, M. Dunn, C. Denholm, C. Neely, and T. Danahy. “Biogeochemical Analysis of Spent Media From a Vertical Flow Treatment Pond of a Passive Treatment System”. Presented at the University of Oklahoma Undergraduate Research Day, April 2016.

Page, B.J., N.L. Shepherd, and R.W. Nairn. “Design and Construction Challenges for the Southeast Commerce Passive Treatment System”. 33rd Annual Meeting of the American Society of Mining and Reclamation: Reclaiming the West. Spokane, WA, June 2016. (poster)

Shepherd, N.L., and R.W. Nairn. “Hydraulic and Biological Maintenance Challenges and Solutions in an Aging Passive Treatment System”. Conference Proceedings: 2016 National Meeting of the American Society of Mining and Reclamation, Spokane, WA: Reclaiming the West, June 4 - 9, 2016.

Matthews, W.J., R.W. Nairn, N.L. Shepherd, Z. Zbinden and A. Geheber. “Fishes of a Heavy Metal Contaminated Superfund Stream (Tar Creek, Oklahoma) after Operation of a Passive Treatment System”. 2017 American Society of Ichthyologists and Herpetologists, Austin, TX, July, 2017.

Nairn, R.W., J. Labar, L. Oxenford, J. Arango, B. Holzbauer-Schweitzer, B. Page, N.L. Shepherd, and R.C. Knox. “Designing ecosystem biogeochemical processes to improve water quality in drastically disturbed watersheds”. 2016 International EcoSummit, Ecological Sustainability Engineering Change, Montpellier, France, August 29- September 1, 2016.

Nairn, R.W., J.A. LaBar, L.R. Oxenford, B.J. Page, N.L. Shepherd, J. Arango and R.C. Knox. "Restoring a Severely Disturbed Watershed via Ecological Engineering: The Role of Passive Treatment Technologies". 24th Annual Conference, Oklahoma Clean Lakes and Watersheds Association, Stillwater, OK, April 2015.

Page, B.J., N.L. Shepherd and R.W. Nairn, "Impacts of Passive Treatment Systems on Water Quality in a Degraded Watershed". 24th Annual Conference, Oklahoma Clean Lakes and Watersheds Association, Stillwater, OK, April 2015. (poster)

Shepherd, N., R.W. Nairn, M. Dunn, C. Denholm, C. Neely, and T. Danahy. "Biogeochemical Analysis of Spent Media from a Vertical Flow Treatment Pond". Conference Proceedings: 2015 National Meeting of the American Society of Mining and Reclamation, Lexington, KY Reclamation Opportunities for a Sustainable Future June 6-11, 2015.

Page, B.J., N.L. Shepherd, and R.W. Nairn. "Identifying and Resolving Passive Treatment System Hydrologic Operation and Maintenance Issues". Conference Proceedings: 2015 National Meeting of the American Society of Mining and Reclamation, Lexington, KY Reclamation Opportunities for a Sustainable Future June 6-11, 2015.

Nairn, R.W., J.A. LaBar, L.R. Oxenford, B.J. Page, N.L. Shepherd, J. Arango, B.K. Holzbauer- Schweitzer and R.C. Knox. "Restoring a Severely Disturbed Watershed via Ecological Engineering: The Role of Passive Treatment Technologies". 15th Annual Meeting of the American Ecological Engineering Society: Designing 21st Century Grasslands: Fire, Water, Conservation and Carbon, Stillwater, OK, June 2015.

Shepherd, N.L., W.J. Matthews, R.W. Nairn, J. Barkstedt, and N. Franssen, "Fishes of a Contaminated Stream After Operation of a Passive Treatment System". Conference Proceedings: 2014 National Meeting of the American Society of Mining and Reclamation, Oklahoma City, OK, Exploring New Frontiers in Reclamation, June 14-20, 2014.

Shepherd, N.L., and R.W. Nairn. "Water Quality and Quantity Analysis to Evaluate Passive Treatment Feasibility for Select Mine Drainage Discharges within the Tar Creek Superfund Site". Great Plains Limnology Conference, Online, October 12-15, 2020.

Shepherd, N.L., and R.W. Nairn. "Mine Drainage Impacts and the Use of Ecological Engineering Solutions in the Tar Creek Superfund Site". Oklahoma Department of Environmental Quality Brown bag Presentation, Oklahoma City, OK, November 17, 2021.

Shepherd, N.L., W.J. Matthews, and R.W. Nairn. "Evaluating the Recovery of Fish Communities in a First Order Stream to Tar Creek After Implementation of Two Passive Treatment Systems". National Environmental Tar Creek Conference, Online, October 26-28, 2021.

Nairn, R.W., Shepherd, N.L., and LaBar, J.A. (2022) Evaluating Sources, Mass Loadings and Fate of Total and Dissolved Metals to Prioritize Restoration in a Mining-Impacted Watershed. National Meeting of the American Society of Reclamation Sciences, Duluth, MN, June 12-16, 2022.

Nairn, R.W., LaBar, J.A., Shepherd, N.L., Dorman, D.M., Arango, J., Holzbauer-Schweitzer, B.K., Tang, Z., and Knox, R.C. (2022) Eighteen Years of Natural Infrastructure Research Partnerships through the Center for Restoration of Ecosystems and Watersheds at the University of Oklahoma. National Meeting of the American Society of Reclamation Sciences, Duluth, MN, June 12-16, 2022.

Shepherd, N.L., and R.W. Nairn (2022) Evaluating the water quantity and quality of mine drainage discharges in a hydrologically and topographically challenging location. National Meeting of the American Society of Reclamation Sciences, Duluth, MN, June 12-16, 2022.

Shepherd, N.L., and R.W. Nairn (2022) Mine Drainage Impacts and the Use of Ecological Engineering Solutions in the Tar Creek Superfund Site. Tribal Lands and Environmental Forum. Milwaukee, WI, August 8-12, 2022.

ARCHAEOLOGICAL INVESTIGATIONS NORTHWEST, INC.

OFFICE LOCATION

3510 N.E. 122nd Avenue
Portland, Oregon 97230

EDUCATION

Ph.D., Anthropology, 2008, State University of New York at Buffalo

M.A., Anthropology, 2002, State University of New York at Buffalo

B.A., Anthropology, 1998, University of California, Santa Cruz

WORK HISTORY

Years with AINW: 10

Prior Experience: 15

REGISTRATION

Register of Professional Archaeologists

Meets Secretary of Interior's Professional Qualification Standards for Archaeology

ODOT Certified for Archaeology

PROFESSIONAL AFFILIATIONS

Society for American Archaeology

ACRA

AINW is a member of the American Cultural Resources Association

Eva L. Hulse, Ph.D., R.P.A.

Senior Project Manager/Senior Geoarchaeologist

Eva L. Hulse, AINW Senior Geoarchaeologist, is a Registered Professional Archaeologist and meets the professional qualifications set forth in the Secretary of the Interior's Standards and Guidelines for Archaeology which are required for federally funded or permitted projects, and for projects needing review under state and local laws and guidelines. She has extensive experience with the reconstruction of geomorphic contexts of deeply-buried historic and prehistoric archaeological sites, with analysis of chemical residues in archaeological soils and sediments, and with GIS and LiDAR reconstruction of past landscapes.

Eva has experience working on infrastructure and environmental cleanup projects throughout the Pacific Northwest. She is highly experienced with Oregon State Historic Preservation Office (SHPO) standards and guidelines, and with federal cultural resource regulatory compliance requirements for Section 106 of the National Historic Preservation Act (Section 106). Examples of project work listed below involved cultural resource assessments in Oregon.

Selected Project Experience:

Gold Hill Sewer Intertie Project, Jackson County, 2023-present. Project manager for cultural resource tasks for a new pump station and sewer line, for review by the U.S. Department of Agriculture, SHPO, and Tribes. The in-progress fieldwork is documenting and evaluating archaeological and historic resources. Tasks have included obtaining a SHPO permit to conduct the archaeological work.

Coffin Butte Landfill Expansion Project, Benton County, 2022-present. Project manager for a cultural resource study in support of a landfill expansion, for review by Benton County, SHPO, Tribes, and the U.S. Army Corps of Engineers. The work was conducted under permit from SHPO and evaluated several archaeological sites. AINW recommended avoidance measures that would lead to a finding of No Adverse Effect.

Sawyer Park Improvements, Bend, 2022-present. Project manager for a cultural resource study in support of park improvements, for review by the Oregon Parks and Recreation Department and the National Park Service, SHPO, and Tribes. Under permit from SHPO, AINW evaluated an archaeological site and a historic park resource, and recommended that the project would have an Adverse Effect on Historic Properties. The team is developing a mitigation plan.

Willamette Cove Environmental Cleanup, Portland, 2020-2022. Prepared an Inadvertent Discovery Plan and trained contractors on cultural resource identification and procedures in advance of environmental sampling work. The project is subject to oversight by the Environmental Protection Agency.

Kingsley Firing Range Survey, Klamath County, 2019-2020. Project manager for cultural resource tasks conducted on behalf of the U.S. Army Corps of Engineers during removal of unexploded ordinance from a former firing range. The work included providing a cultural resource training for contractors, monitoring cleanup activities, and documentation of several archaeological sites. The work was conducted in close consultation with SHPO. AINW provided recommendations for avoidance of sensitive areas.

LISA SPLITTER, P.E., G.E. **YEARS OF EXPERIENCE: 20**
Senior Geotechnical Engineer

EDUCATION
M.S., GeoEngineering, University of California, Berkeley
B.S., Civil Engineering, California Polytechnic State University, San Luis Obispo

PROFESSIONAL REGISTRATIONS
Professional Engineer (OR, CA, WA)
Geotechnical Engineer (OR, CA)

SUMMARY OF EXPERIENCE
Lisa provides geotechnical engineering services including project management, construction observation, and subsurface explorations throughout the northwest region. Her experience includes coordinating subsurface investigations; performing engineering analyses including engineered excavations, soil settlement, bearing capacity, pile capacity, seismic hazards, slope stability, deep excavations, asphalt pavement, and lateral earth pressures; preparing reports; and managing construction projects. Lisa has extensive experience with difficult soil and rock conditions, including soft soil, diatomaceous earth, deep pumice deposits, lava tubes, and fractured rock.

RELEVANT PROJECTS
Negus Recycling & Transfer Facility, Deschutes County Department of Solid Waste, Redmond, Oregon; As part of the CEC team, Lisa was the geotechnical engineer of record. Construction included a transfer station, office, maintenance building, recycling center, recycling office and loadout, and inbound and outbound scales. Detailed subsurface exploration was performed to define areas of undocumented fill and existing waste materials, and to evaluate the potential for lava tubes. Geotechnical recommendations included compaction of deep fills, 20-foot-tall basalt rock engineered excavations, and large retaining walls. Lisa provided same day site visits to provide geotechnical recommendations during construction, allowing the project to move forward without delay.

Coffin Butte Landfill, Republic Services, Deschutes Valley Water District, Corvallis, Oregon; As part of the CEC team, Lisa was the geotechnical engineer of record for the design of the 150-acre cell expansion project, beginning in 2021. The new landfill cell will require cuts of up to 155 feet into the northern flank of Tampico Ridge and construction of new, 50-foot-deep leachate ponds. Wallace Group performed subsurface explorations and provided geotechnical and geologic engineering recommendations including slope stability, engineered excavations in soil and rock, and settlement analyses of soft silt.

Columbia Ridge Landfill, Renewable Natural Gas Plant, Waste Management, Arlington, Oregon; Wallace Group provided geotechnical engineer of record and construction observation and special inspection services for the design of the Renewable Natural Gas Plant project, beginning in 2023. Development plans include construction of two new buildings, water tanks, flares, large diameter gas pipelines, exterior equipment, and vessels. Wallace Group worked closely with the construction team to economize the soil fill selected by observing oversize material placement. Project challenges included deep excavations and loose soil conditions.

Rabe Consulting

Andréa Rabe, MS, PWS

Botanist/ Environmental/Professional Wetland Scientist
andrea@rabeconsulting.com

EDUCATION:

M.S. Botany, Washington State University, Pullman, WA, 1997.
B.S. Genetics and Anthropology, University of California, Davis, CA, 1995.
PWS, Professional Wetland Scientist Certification, 2010.

Certified Lead-Based Paint Inspector
Certified Asbestos Inspector

EXPERIENCE:

Sept 1997-Present **SR. ENVIRONMENTAL CONSULTANT**, Rabe Consulting, Klamath Falls, OR and Fresno, CA.

- Conducted wetland delineation and wetland advising for Klamath County Public Works.
- Conducted wetland delineations and botanical surveys for 18 projects in 2019.
- Prepared NEPA documents, including EA, EIS, Environmental Report and Biological Assessment.
- Conducted vascular plant surveys for Bureau of Land Management, Oregon Department of Forestry and Fruit Growers for 15 field seasons. Identified and located noxious weeds and threatened/endangered species for timber sales and prescribed burns. Mapped plant populations. Prepared and submitted reports.
  - Evaluated and monitored riparian and wetland vegetation for 15 restoration projects in 2019. Vegetation monitoring including species list, habitat condition, and diversity.

Sept 2000-2012 **NATURAL RESOURCE FACULTY**, Klamath Community College, Klamath Falls, OR

- Instructed biology lecture and laboratory for biological science major students.
- Presented classes in plant identification, wetland delineation, and environmental science.
- Developed and implemented watershed science curriculum for retraining displaced workers.

PUBLICATIONS:

Rabe, Andrea, Christopher Calonje, and Michael Calonje. 2006. Forest Trails of Klamath County. 2nd Edition.

Rabe, Andrea, Christopher Calonje and Michael Calonje. 2005. Klamath County Forestry Trails.

Rabe, Andrea and Christopher Calonje. 2004. Sensitive Status Plants of Klamath County.

Rabe, Andrea and Lani Hickey. 2001. Noxious weeds of Klamath County, Oregon.

Rabe Consulting

Madison Barr
Project Manager
madison@rabeconsulting.com

EDUCATION:

B.S. Business Administration: Management
Northern Arizona University, Flagstaff, AZ Dec 2021.

EXPERIENCE:

April 2022-Present **PROJECT MANAGER**, Rabe Consulting, Klamath Falls, OR and Fresno, CA.

- Assists in writing and reviewing technical reports including Environmental Assessment Phase I Reports, National Environmental Policy Act (NEPA) Reports (multiple states), Biological Assessment, Environmental Impact Statements.
- Is the liaison between the clients and environmental consultants for all project communication.
- Develops technical project proposals including RFPs and RFQs for local and federal projects.
- Conducts project notification and correspondence between state tribes and SHPO offices for NEPA compliance.
- Uses financial and market data to develop feasibility reports for USDA project loans and grants.

Jan 2022-April 2022 **RECRUITER**, Signature Consultants, Phoenix, AZ

- Engaged with IT professionals on the job market and worked towards placing them in open job orders with our clients.
- Worked closely with Account Managers to understand open positions and communicate the strengths of the best candidates on the market.
- Built relationships with consultants and actively recontacted them every month.
- Scheduled interviews, formatted resumes, and made cold calls.

Aug 2020-May 2021 **TICKET SALES INTERN**, Northern Arizona University Athletics, Flagstaff, AZ

- Developed technical marketing reports that analyzed ticket sales at NAU athletic events.
- Used data from campus surveys to write detailed marketing plans to boost ticket sales for the next season.
- Created and executed a campus wide scavenger hunt that promoted the athletic department and got students involved.

SCOTT WALLACE, R.G., C.W.R.E.

YEARS OF EXPERIENCE: 36

President and Principal Geologist

EDUCATION

M.S., Geology, Western Washington University, Bellingham, Washington
B.S., Geology, Southern Utah University, Cedar City, Utah

PROFESSIONAL REGISTRATIONS

Registered Geologist (OR)
Certified Water Rights Examiner (OR)
Licensed Geologist (WA)
Licensed Engineering Geologist (WA)
Licensed Hydrogeologist (WA)

SUMMARY OF EXPERIENCE

Scott has professional consulting and business management experience in the geoscience industry. He is a recognized expert in the geologic systems of the Pacific Northwest and Intermountain West regions, and his multi-disciplinary expertise includes groundwater hydrogeology, engineering geology, environmental compliance and permitting, remedial investigations/feasibility studies, geologic hazards, and water rights. He has served in a management and technical discipline lead role for private, public, and government clients on water resource projects for municipal supply, irrigation, fisheries, mining, and water storage throughout the western U.S. He advises clients on technical issues, writes and reviews technical reports and communications, provides expert witness testimony, and has served as a regulatory liaison at the federal, state, and local level.

RELEVANT PROJECTS

M.R. Sampson Coho Hatchery, Yakima Nation Fisheries, Ellensburg, Washington; Principal Hydrogeologist for the comprehensive evaluation of the groundwater flow regime underlying sensitive tribal lands along the Yakima River. He led a team of geologists and design engineers to develop a groundwater wellfield and new hatchery to support natural salmon spawning and harvest opportunities in the Yakima River Basin.

Opal Springs Hydro Dam Improvements & Fish Passage, Deschutes Valley Water District, Crooked River, Oregon; Project Principal Geologist/Hydrogeologist to remove major barrier to salmon and steelhead migration and reintroduction effort in the upper Deschutes Basin. Wallace Group services included geotechnical engineering, spring mapping and drainage mitigation, earthwork and dam crest monitoring, construction materials testing and special inspection.

The Deschutes Land Trust Conservation and Restoration Projects, Deschutes, Jefferson, and Crook Counties, Oregon; Mr. Wallace was the Principal-in-Charge of a multidisciplinary team providing the DLT with a comprehensive suite of engineering and environmental consulting services including geotechnical studies for floodplain restoration and pedestrian bridges, groundwater flow and water quality monitoring programs, environmental site assessments, hazardous material management, and mineral resource assessments. Notable projects including Camp Polk Meadow, Ochoco Preserve, Priday Ranch, Wychus Canyon Preserve, and Rimrock Ranch.

Adam Williams, PE, GE

Principal Geotechnical Engineer

Mr. Williams has over 17 years of experience in geotechnical/geological engineering, and engineering geology. Mr. Williams is the leader of Kleinfelder's rock engineering practice and has worked on many projects throughout the United States, Canada and Australia. His experience includes rock and soils engineering for tunnels and pipelines, dams and reservoirs, shallow and deep foundations, retaining walls and excavations, slope stability, slope reinforcement and landslides, geotechnical instrumentation, in situ testing, rock and soil laboratory testing, geologic and geomechanical mapping, and ground characterization. Mr. Williams has performed geotechnical investigations and design on quarries, open-pit mines and buried reservoirs with excavations that are similar to the proposed Moon Pit dimensions.

Below are recent projects where Mr. Williams performed rock slope engineering.

Years of Experience
17 years

Education
Bachelors, Geological Geophysical Engineering, University of Utah, Utah, 2006

Registrations
Professional Engineer (PE)-Civil, No. 79492, CA

Geotechnical Engineer (GE), No. 3124, CA

Professional Engineer (PE)-Civil, No. 80261412202, UT

Professional Engineer (PE)-Civil, No. 027288, NV

Professional Engineer (PE)-Civil, No. 59987, CO

Professional Engineer (PE)-Civil, No. 87309, OH

Professional Engineer (PE)-Civil, No. 19187, WY

Professional Engineer (PE)-Civil, No.

Professional Affiliations
American Society of Civil Engineers, Member, From date: 12/20/2013

Select Project Experience

Black Metal Mountain, Metropolitan Water District (MWD) of Southern California, San Bernadino County, CA, 2023
MWD is improving access to facilities at the Gene Camp and Gene Wash Reservoir. The existing access roads are located in rugged terrain where improvements require large rock cuts and rock reinforcing for several areas to widen and improve the existing access roads. Mr. Williams assisted in the geotechnical exploration and mapping, prepared the geotechnical report, and helped to prepare the plans and specifications for the project.

Miners Mesa, Western States Contracting, North Las Vegas, CA, 2022
Miners Mesa is part of the APEX Industrial Park being constructed in North Las Vegas, Nevada. The 110-acre site is currently being graded for future construction of industrial buildings and supporting facilities. During grading of the slope areas south of the tank pad, blast damage resulted in overbreak of the over 100-foot-high rock slope that was planned. Western States Contracting retained Kleinfelder to perform additional geotechnical investigations and analyses, and to provide recommendations for grading these areas. Mr. Williams was the geotechnical engineer of record for the project and helped to oversee the geotechnical field investigation, rock slope stability analysis, rockfall analyses, grading design and construction of a rockfall mitigation for the slope that consisted of an anchored steel-wire mesh.

Marble Cliff Quarry, Shelly Materials, Hilliard, Ohio 2021
Shelly Materials retained Kleinfelder to investigate two bench areas in a limestone quarry that they acquired that had experienced severe overbreak from blasting. The two areas consisted of a North Block, which was a 40-foot-tall by 50-foot-wide by 30-foot-long block that had partially detached from the in place bedrock, and a South Block, which was a 50-foot tall bench where the limestone was more highly fractured and thinly bedded that was overbroken from blasting and had formed many marginally stable pillars (topples) and wedges. Kleinfelder completed a field investigation and prepared a geotechnical report with recommendations for safely grading the hazardous areas. Mr. Williams was the geotechnical engineer of record for the project who prepared the geotechnical report.

GREGORY C. BLACKMORE

19454 Sunshine Way · Bend, OR 97702 / Phone: 541.419.1455 / Email: greg@blackmoreplanning.com

Expanding opportunities by facilitating effective public processes

PROFESSIONAL EXPERIENCE

BLACKMORE PLANNING AND DEVELOPMENT SERVICES, LLC – Bend, OR
Manager / Owner, January 2012 – Present

Owner and operator of a regional planning and land development consulting business focused on serving developers, non-profit organizations, and government agencies.

Notables: City of Redmond Analysis of Impediments to Fair Housing, Discovery Park Site Plan, Cluster Housing Developments (Northwest Crossing and Mt. Bachelor Village), ClearPine Master Plan, Waterway Overlay Zone Restoration Plans, City of Bend Plan Amendment and Zone Changes

FIRST AMERICAN TITLE – Bend, OR
Customer Service Manager / Land Development Rep – July 2012 – July 2014

Customer Service Manager - Lead an expert team of professionals to provide exceptional service and useful products. Managed front desk staff and a property research team focused on providing clients with accurate, timely and useful market information.

Land Development Representative - Assisted Builders, Developers and Agents with development opportunities; identified strategic investment opportunities, tracked and delivered public documents, and established master project plans for title and escrow services.

Notables: Implementation of new phone system, client-tracking software, new GIS resources, court mobile scanning, and development of a builder services program.

CITY OF BEND – Bend, Oregon
Program Manager - Admin. / Econ Dev. Department, May 2010 to July 2012

Neighborhood Stabilization Program (NSP)
Responsible for NSP grant administration, including budgeting and reporting (state, federal, City Council and Affordable Housing Committee), program development, marketing, RFP development and review, loan origination, underwriting and processing, home inspections, environmental reviews, project management, payment processing, monitoring and grant close-out.

Notables: Program removed over 100 foreclose properties from our local market by directly investing close to $3 million and leveraging of $10 million in private investment.

Mirror Pond Liaison (Feb 2012-July 2012)
Responsible for staff support to the Mirror Pond Management Board and the Mirror Pond Steering Committee. As directed by the board and committee, duties included researching local, state and federal permit processes, coordinating with state and federal agencies, outlining program tasks, developing cost estimates, and researching sediment and water quality data. Other duties include preparing agenda, keeping meeting notes, and facilitating meetings.

Associate Planner - Community Development Department, September 2006 to November 2009
Assisted developers to navigate the land use system, including state land use laws, ordinances, comprehensive plans and goals. Facilitated the review of site development, subdivision, and other quasi-judicial and legislative land use applications. Prepared oral and written staff reports to the Planning Director, Planning Commission, Landmarks Commission, and City Council. Provided customer service to the public related to zoning, land use, and development.

Notables: Development Code Map and Text Amendments, Zone Changes, Juniper Ridge Special Planned District, Westside Church Expansion, Vacation Home Rentals and ADU's in Drake Park Historic District.

MACKAY AND SPOSITO, INC. – Vancouver, Washington
Contract Planner – Central Oregon Region, February 2010 to Present
Provided planning and development related services to clients, including public and private entities, in the Central Oregon on a contractual basis.

Notables: PacifiCorp Zone Change and Partition at Juniper Ridge, Employment Sub-District Zone Change and Sub-Division at Juniper Ridge.

CITY OF SISTERS – Sisters, Oregon
Planner - Planning and Community Development Department, July 2005 to August 2006
Reviewed building permit, site design review, subdivision and other land use applications for compliance with City and state land use laws, ordinances, comprehensive plans and goals. Prepared oral and written staff reports to the Planning Director and Planning Commission. Code enforcement and customer service to the public related to zoning, land use and development.

Notables: Completed a comprehensive department fee analysis and assessment, resulting in fees that sustained effective services, developed a code enforcement tracking system.

NEIGHBORIMPACT (NI) – Redmond, Oregon
Construction Specialist - Community Development Dept., September 2002 to December 2003
Managed regional loan fund, wrote and administered grants, managed construction projects, managed project budgets, and reported to Executive Director and Board of Directors.

Notables: Managed a $2.7 million regional loan fund, developed properties in the Madras Community Land Trust, and oversaw construction of the Bend Family Shelter and a Head Start Facility.

Housing Loan Coordinator – Community Development Dept., August 1999 to August 2001

Managed the housing rehabilitation loan program, including program development, grant writing and field assessments, maintenance of client files and program manuals, program tracking and budgeting, facilitation of loan review reports and meetings, administration of program payments, functioning as a liaison between contractors and homeowners, primary contact for state affordable housing departments, cities and counties.

Notables: Approximately 40 housing rehabilitation projects totaling approximately $600,000.

AMERICORP*VISTA – Bend, Oregon

Individual Dev. Account (IDA) Coordinator, *NeighborImpact*, October 1997 to October 1998

Developed an Individual Development Account program to assist homeless and low-income individuals achieve permanent housing solutions, asset development, and financial stability. Responsibilities included, grant writing, development of program policies, procedures and marketing materials, client services, facilitation of program orientation, interviews and presenting reports to a selection committee, development and implementation of economic literacy classes, counseling and case management, tracking and recording participant and program progress.

Notables: Pilot program was effective in demonstrating the effectiveness of the concept. Currently there is a statewide program funded through tax credits, which has help thousands of individuals built long term wealth and assets.

EDUCATION

University of New Hampshire - Durham, New Hampshire
Masters of Arts - Economics. September 2002.

Ohio University - Athens, Ohio
Bachelor of Arts - Economics / Minor in Environmental Studies. June 1997.

Joe Bessman is a registered professional civil engineer based in Central Oregon and specializing in Transportation Engineering. Joe provides a breadth of project experience spanning the public and private sectors, with a primary emphasis within transportation system planning, master planning/entitlements, and conceptual improvement identification and design. Joe serves as a modular element of an overall project team, working closely with the civil team to advance conceptual plans to feasible designs. Joe supported the CEC team with transportation elements of the Coffin Butte Landfill and Negus Transfer Facility, providing a pragmatic and meticulous approach to address agency and public comments on the landfill expansion plans. Joe serves as owner and principal engineer with Transight Consulting, LLC.

JOE BESSMAN, PE

Transight Consulting, LLC

Owner, Principal

EDUCATION

BS Civil Engineering,
University of Portland (2002)

YEARS OF EXPERIENCE

22

LICENSES

Professional Civil Engineer
(Transportation Specialty)
Oregon, Washington, & Idaho

REFERENCES

Upon Request.

RELEVANT EXPERIENCE

Projects relevant to the proposed landfill effort are listed below:

Coffin Butte Landfill (2020 to Present)

Joe worked as a subconsultant to CEC on the Coffin Butte Landfill project in Benton County, Oregon. Transportation efforts included preparation of submittal materials, coordination with the overall project team, and support to the team throughout the contentious hearings process. The landfill location and access has been subsequently modified and was recently submitted to the County.

Negus Transfer and Recycling Facility Improvements (2020)

Joe led the transportation entitlements work on the Negus Transfer Station facility improvements as a subconsultant to the CEC team. The overall project enhanced the internal circulation and separation of refuse and recycling, with a 30,000 square-foot building replacing the open-air trailer bays. The Transight Consulting work efforts addressed Deschutes County's transportation requirements for the site, linking future transfer facility use to area population projections, and demonstrating that the access route can perform acceptably throughout the horizon planning period. The transportation materials and the overall project were approved by Deschutes County.

Parkside Place Master Plan (2021 to 2023)

Parkside Place is a 37-acre affordable housing project on Bend's eastern boundary that directly abuts the US 20 corridor, with ODOT access coordination expected to be similar to the proposed landfill site. The transportation elements of the project included rezoning and annexing the property from Deschutes County into the City of Bend, and working with City and ODOT staff to obtain permitted access to US 20 and a phased improvement plan for the approximately 350-unit development. Initial phases of this project are currently under construction.

Additional Deschutes County Transportation Support

- Downtown Bend Campus Parking and Circulation Planning (2022 to Present)
- Courthouse Expansion Project (2023)
- Deschutes County Safety Campus Expansion (2020)

APPENDIX D – CEC CONTRACT EXCEPTIONS

CEC CONTRACT QUESTIONS/EXCEPTIONS

Comment No. 1:

10. Work Standard.

a. Contractor shall be solely responsible for and shall have control over the means, methods, techniques, sequences and procedures of performing the work, subject to the plans and specifications under this Contract and shall be solely responsible for the errors and omissions of its employees, subcontractors and agents.

b. For goods and services to be provided under this contract, Contractor agrees to:
   1) perform the work in a good, workmanlike, and timely manner using the schedule, materials, plans and specifications approved by County;
   2) comply with all applicable legal requirements;
   3) comply with all programs, directives, and instructions of County relating to safety, storage of equipment or materials;
   4) take all precautions necessary to protect the safety of all persons at or near County or Contractor's facilities, including employees of Contractor, County and any other contractors or subcontractors and to protect the work and all other property against damage.

c. For Professional Services to be provided under this contract:
   1) Contractor shall perform its services consistent with the professional skill and care ordinarily provided by professionals, such as Contractor, practicing in the same or similar locality under the same or similar circumstances ("Standard of Care"). Any services not meeting the Standard of Care shall be re-performed at Contractor's sole cost.

Comment No. 2:

21. Indemnity and Hold Harmless.

a. To the fullest extent authorized by law Contractor shall defend (and for professional liability claims, reimburse defense costs to the proportionate extent of its liability), save, hold harmless and indemnify the County and its current and former officers, departments, employees and agents from and against any and all claims, suits, actions, losses, damages, liabilities costs and expenses of any nature, and by whomever brought, resulting from, arising out of or relating to the activities of Contractor or its current or former officers, employees, contractors, or agents, including without limitation any claim that any work, work product or other tangible or intangible items delivered to County by Contractor may be the subject

of protection under any state or federal intellectual property law or doctrine, or that the County's use thereof infringes any patent, copyright, trade secret, trademark, trade dress, mask work utility design or other proprietary right of any third party, but only to the extent caused by the negligent acts, errors, omissions, or willful misconduct of the Contractor during the performance of the services.

Comment No. 3:

33. Allocation of Risk.

~~d.~~a. Except for liability arising from Contractor's gross negligence or willful misconduct and except for Contractor's indemnity obligations for third party claims for personal injury or property damage, Contractor's liability is limited in the aggregate to the minimum insurance provided under this Contract.

Comment No. 4:

Professional Liability insurance with ~~an occurrence combined single~~a limit of not less than: Per ~~Occurrence~~ Claim limit	Annual Aggregate limit
☒ $1,000,000	☒ $2,000,000
☐ $2,000,000	☐ $3,000,000
☐ $3,000,000	☐ $5,000,000